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Tongass National Forest

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ROD

RECORD OF DECISION

FEIS

FINAL ENVIRONMENTAL
IMPACT STATEMENT

COUVERDEN TIMBER SALES

Tongass National Forest



July 2005

Couverden Timber Sales

Record of Decision

Tongass National Forest USDA Forest Service Alaska Region

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Couverden Timber Sales Record of Decision

Introduction

This Record of Decision (ROD) documents my decision to select Alternative 3 with modifications from the Couverden Timber Sales Final Environmental Impact Statement (FEIS). The selection includes the specific location and design of timber harvest units, roads, and the log transfer facility (LTF). Timber harvest units designed for small sales are identified in this ROD. In addition, this Decision includes road access management measures, mitigation and monitoring requirements, and a determination regarding effects on subsistence uses. This ROD also makes a decision concerning a non-significant amendment to the 1997 Tongass Land and Resource Management Plan (Forest Plan) to adjust the size and configuration of one of the small old-growth reserves (OGRs) in the project area.

The Couverden project area is on the south Chilkat Peninsula, within the Juneau Ranger District, Tongass National Forest, Alaska, and encompasses approximately 49,500 acres on the Chilkat Peninsula. It is approximately 30 air miles west of Juneau, 20 air miles southeast of Gustavus, and 13 miles northeast of Hoonah, Alaska. The project area lies within Townships 41 and 42 South, and Ranges 61, 62, and 63 West, Copper River Meridian (Figure 1-1 in the FEIS).

Background

The proposed project is a component of the overall timber sale program on the Tongass National Forest. Timber sales are allowed by the Forest Plan in order to maintain a supply of timber from National Forest System lands for Southeast Alaska.

The National Environmental Policy Act (NEPA) process for the Couverden Timber Harvest began in July 2002. A proposed action for the Couverden project area was first published in the Federal Register as a Notice of Intent on July 23, 2002, when it was decided that an Environmental Impact Statement (EIS) was to be undertaken for the project. This Notice of Intent and Proposed Action were consistent with the 1997 Forest Plan.

After the notice in the Federal Register, public scoping, data collection and analysis, and documentation began. A Draft Environmental Impact Statement (DEIS) was distributed in December 2003. Public review and comments on the DEIS were collected until March 29, 2004. Each of the substantive comments has been reviewed and responded to, and the FEIS has been prepared.

When the DEIS was published, six alternatives were considered in detail. Alternative 2 contained unit boundaries that included some unroaded and roadless areas that were being considered for wilderness recommendation in the 2003 Forest Plan Supplemental Environmental Impact Statement

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(SEIS). Alternative 3 was developed to avoid any roadless and unroaded areas being reviewed in the 2003 SEIS. I identified Alternative 3 as the Preferred Alternative.

The Forest Plan SEIS, which evaluated roadless areas for wilderness consideration, was completed and signed in February 2003. The No Action Alternative of the SEIS was selected, continuing management under the 1997 Forest Plan, with no new wilderness recommendations. The Roadless Area Conservation Rule (Roadless Rule, January 2001) generally prohibited timber harvest and road construction in Inventoried Roadless Areas (IRAs) on National Forest System lands. In July 2003, the U.S. District Court for the District of Wyoming set aside the Roadless Rule and permanently enjoined its implementation. On May 11, 2004, the Tenth Circuit Court of Appeals agreed to hear the appeal of the Wyoming District Court's July 14, 2003, order to permanently enjoin and set aside the roadless rule. On July 12, 2004, the USDA announced that it was publishing for public review and comment a proposed rule that would replace the 2001 roadless rule with a petitioning process that would allow Governors an opportunity to seek establishment of management requirements for National Forest System inventoried roadless areas within their States. In addition, the Forest Service announced that it was reinstating the interim protection measures for inventoried roadless areas that expired on June 14, 2003.

This project is consistent with current agency policy and procedures, and has been designed to meet the management direction (goals and objectives, standards and guidelines) in the Forest Plan.

Effective May 13, 2005, The Department of Agriculture revised the 2001 Roadless Area Conservation Rule (Subpart B of Title 36, Code of Federal Regulations, Protection of Inventoried Roadless Areas) by adopting a new rule, Special Areas; State Petitions for Inventoried Roadless Area Management. This 2005 Roadless Rule establishes a petitioning process that provides Governors an opportunity to seek establishment of or adjustment to management requirements for National Forest System inventoried roadless areas within their States. Submission of a petition is strictly voluntary. Management requirements for inventoried roadless areas are guided by the Tongass Forest Plan until and unless these management requirements are changed through a State-specific rulemaking. If the Secretary of Agriculture accepts a petition, the Forest Service shall be directed to initiate notice and comment rulemaking to address the petition. Further details on the history of the Roadless Rule and how it affected development of this project are available in the project record.

In December 2003, as part of a settlement agreement reached in the State of Alaska v. USDA, the Department adopted a final rule that temporarily withdrew the Tongass National Forest from the provisions of the 2001 roadless rule. Under the approach established in this 2005 final rule, management of inventoried roadless areas on the Tongass will continue to be governed by the existing Forest Plan, unless changed through a State-specific rulemaking as described above. This 2005 rule negates the need for further Tongass-specific rulemaking anticipated in the 2003 temporary withdrawal.

Purpose and Need

The Couverden project is proposed at this time to respond to goals and objectives of the Forest Plan, and to help move the project area towards desired future conditions described in that plan. The Forest Plan includes forest-wide goals and objectives, and area-specific (Land Use Designation [LUD]) goals, objectives, and desired future conditions. Applicable forest-wide goals and objectives include the following:

- ♦ Manage the timber resource for production of saw timber and other wood products from suitable timber lands made available for timber harvest on an even-flow, long-term sustained yield basis and in an economically efficient manner.
- ♦ Seek to provide a timber supply sufficient to meet the annual market demand for Tongass National Forest timber, and the market demand for the planning cycle.
- ♦ Provide a diversity of opportunities for resource uses that contribute to the local and regional economies of Southeast Alaska.
- ♦ Support a wide range of natural resource employment opportunities within Southeast Alaska's communities.

Goals, objectives, and desired future conditions of the LUDs within the project area are described in Chapter 1 of the FEIS in the section titled "Relationship to the Forest Plan."

Appendix A of the FEIS provides information on how this project relates to the overall Tongass Timber Sale program, and why the project is being scheduled at this time.

Section 101 of the Tongass Timber Reform Act of 1990 (TTRA) directs the USDA Forest Service "to the extent consistent with providing for the multiple use and sustained yield of all renewable forest resources, seek to provide a supply of timber from the Tongass National Forest which (1) meets the annual market demand for timber from such forest, and (2) meets the market demand from such forest for each planning cycle."

Section 101 of TTRA specifies that Forest Service efforts to seek to meet market demand is subject to appropriations, National Forest Management Act requirements, and other applicable laws. Providing timber from the Tongass National Forest benefits a sustained local wood products industry, contributes employment and related economic and social benefits, and helps meet the Forest Plan's objective of supporting a wide range of natural resource employment opportunities within Southeast Alaska's communities.

National forest planning takes place at several levels, including national, regional, forest, and project levels. The Couverden EIS is a project-level analysis. Its scope is confined to addressing the significant issues and possible environmental consequences of the project. It does not attempt to address decisions made at higher levels. It does, however, implement direction provided at those higher levels.

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The Forest Plan embodies the provisions of the National Forest Management Act, its implementing regulations, and other guiding documents. The Forest Plan sets forth in detail the direction for managing the land and resources of the Tongass National Forest. The Forest Plan is the result of extensive analysis, which is addressed in the Forest Plan FEIS and the May 1997 Forest Plan ROD. The 2003 Forest Plan SEIS also refreshed many of the analyses in the 1997 Forest Plan FEIS. Where appropriate, the Couverden EIS tiers to the Forest Plan FEIS and SEIS, as encouraged by 40 Code of Federal Regulations (CFR) 1502.20.

Decision

This ROD documents my decision to make timber available from the Couverden project area. It is my decision to choose Alternative 3 from the FEIS with modifications (referred to as the Selected Alternative) that incorporate some of the design features of Alternative 2 (inclusion of unroaded areas). With the 2003 SEIS now concluded, there is good reason to select units based on their original configuration. Harvesting complete settings will avoid leaving isolated parcels of timber. My decision identifies several small sales opportunities as part of the Selected Alternative. My decision also includes a non-significant Forest Plan amendment to enlarge the small OGR in Value Comparison Unit (VCU) 1180 as shown in Appendix 1 of the ROD. This decision reflects the recommendations of an interagency review team to extend the current boundary farther up the east side of Swanson Creek along the 800-foot contour.

I hereby authorize the actions necessary to implement my decision in the Couverden project area.

This decision meets the purpose and need for the project, is consistent with the Forest Plan, and is responsive to the issues raised during scoping and to the public comment on the DEIS. The Selected Alternative will harvest approximately 23 million board feet (mmbf) of timber, construct 3.8 miles of classified road (2.2 miles new; 1.6 miles on existing road bed), and 3.6 miles of temporary road. (Note: All acres and miles used in this document are estimates based on GIS mapping.)

The following modifications to Alternative 3 are included in this decision:

- ♦ Boundaries of harvest Units HS5, HS7, H12, H15, H18, H25, and H26 are based on unit configurations from Alternative 2. These boundaries include unroaded and roadless areas identified in the 2003 SEIS to the Forest Plan (see Introduction of Appendix C of the Forest Plan SEIS and Figure 3-1 of the Couverden FEIS). These unit configurations do not include areas within Inventoried Roadless Area # 304.
- ♦ The following changes were made:
 - HS5 – Net change from Alternative 3 = + 6 acres.
 - HS7 – Net change from Alternative 3 = + 4 acres.
 - HS12 – Net change from Alternative 3 = + 15 acres.

- H15 – Net change from Alternative 3 = + 3 acres.
- H18 – Net change from Alternative 3 = + 1 acre.
- H25 – Net change from Alternative 3 = + 45 acres. An additional 0.4 mile of classified road will be needed (as analyzed for Alternative 2).
- H26 – Net change from Alternative 3 = + 28 acres.
- ♦ Net increase of 102 acres.
- ♦ The boundaries of these units were chosen to avoid isolating small areas of suitable land that would not be accessible using conventional logging systems, unless these small areas were included at this time.
- ♦ Road 8550 will be closed at the Class I stream south of Unit HS7 in response to comments regarding wildlife habitat (Issue 2) to protect an important bear feeding area. This will reduce open road mileage from current conditions by 0.8 mile.
- ♦ All new roads will be placed in storage after completion of the timber sale and will not be suitable for normal vehicle traffic. Also, all new temporary roads will be obliterated after use. This will reduce the exposure of wildlife populations to increased hunting and trapping resulting from increased road density and reductions in habitat quality.

My decision identifies several small sale opportunities (see ROD Appendix 2, Unit Cards, and Figure R-2). Comments on the DEIS indicated a need for small sales in the Couverden area.

I have decided to make meeting the needs of smaller mills a priority from the project area. Over the next several years, the entire volume offered may not equal the total volume cleared for harvest in this decision. If we continue to meet the small mills' volume needs, I am willing to accept that outcome. This decision virtually guarantees a wood supply for local small mills over the next ten years if they choose to take advantage of it. One of the benefits of this decision is that owners of small mills may be able to secure financing to invest in their operations to better utilize the volume we will make available.

If these small, economically attractive timber sales are not purchased, whether for lack of interest or lack of market, I do reserve the right to offer larger economic timber sales to meet the demand for timber within the region. Even then, if we take that approach, it does not preclude the opportunity for small roadside timber sales that could provide smaller volumes desirable for small mills.

Features of the Selected Alternative

The Selected Alternative includes the following features:

- ♦ The Selected Alternative will harvest timber from approximately 861 acres in the project area using cable and ground-based yarding systems. No helicopter harvest is included because of the increased

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cost over using cable and ground-based yarding systems. This harvest will provide an estimated 23 mmbf of sawlog and utility volume based on volume estimates. Design features and mitigation measures for these harvest units are described in detail on the Unit Cards in Appendix 2 of the ROD.

- ♦ The Selected Alternative includes silvicultural prescriptions aimed at responding to concerns over potential visual effects and the availability of wildlife habitat associated with timber harvest in the project area (Issue 4).
 - Most of the acres proposed for harvest (approximately 631 acres) would be clearcut with reserves, but would be designed to meet the Visual Quality Objectives (VQOs) through mitigation efforts, such as feathering and concentrating reserve trees in areas visible from Visual Priority Routes and other use areas. Mitigation measures are listed in Appendix 2 of the ROD, including unit-specific information on the Unit Cards.
 - Single tree selection and group selection (selection harvest) is proposed for six units (approximately 230 acres) to mitigate the visual impacts of timber harvest as viewed from saltwater and to maintain habitat diversity by creating conditions that more closely emulate natural disturbance events. These units include HS5, HS7, H12, H14, H17, and S42. Mitigation measures are listed in ROD Appendix 2, including unit-specific information on the Unit Cards.
- ♦ There will be 3.8 miles of new classified road construction, 1.6 miles of which will be on the roadbeds of unclassified roads. These roads are designed for long-term use and will be placed in storage (Maintenance Level 1) after timber harvest is complete. Placing a road in storage includes such activities as removing culverts and installing water-bars; however, the roadbed would be mostly left intact and could be reconditioned for future use. Until that time, the road is kept in a self-maintaining condition and is not usable for normal vehicle traffic.
- ♦ There will be 3.6 miles of temporary roads construction. After use, the temporary roads will be obliterated as part of the timber harvest operation. Obliteration includes stabilization and restoration measures such as blocking the entrance to a road, installing water-bars, removing culverts, restoring vegetation, removing fill where appropriate, and re-establishing former drainage patterns.
- ♦ Approximately 0.8 mile of existing road will be placed into storage (Maintenance Level 1), leaving 29.9 miles of road open for normal vehicular use after the completion of timber harvest activities.
- ♦ This ROD incorporates mitigation measures to minimize or eliminate potential adverse environmental effects of timber harvest and road construction specified in the Selected Alternative. These mitigation measures are discussed in Chapter 2 and listed in Appendices B, C, and D of the FEIS, and in Appendix 2 of this ROD. Chapter 2 also

contains the project level implementation and effectiveness monitoring designed to determine how well resource management objectives have been met.

- ♦ The roads analysis prepared for this project identified five culverts on roads in the project area that do not meet the current standards for fish passage. These will be replaced.
- ♦ My decision includes a non-significant Forest Plan amendment to enlarge the small OGR in VCU 1180 (Appendix 1). This decision reflects the recommendations of an interagency review team to extend the current boundary farther up the east side of Swanson Creek along the 800-foot contour. The adjusted boundary will be 300 feet from all classified roads to reduce disturbance and exclude all young managed stands. The additional forested acreage will include high-volume old-growth stands that provide high-value deer, marten, marbled murrelet, and goshawk habitat (Issue 2).
- ♦ An existing land-to-barge type LTF and sort yard will be used. Some reconstruction within the current footprint of the LTF may be needed to improve operator safety. Logs would be transferred directly from pier to barge without in-water dumping or storage of logs under the Selected Alternative, eliminating potential concerns from bark accumulation in the near-shore waters.
- ♦ A seasonal dock will be placed at the Homeshore LTF. It will be placed in service in early spring and removed in late fall. When in place, the dock will be available for public use.
- ♦ A logging camp may be needed to facilitate the timber harvest. The camp will be set up in the area used for past logging camps; no additional clearing will be required. The operator of the camp will be responsible for securing appropriate permits from other state and federal agencies.
- ♦ I have determined that the effects of the Selected Alternative on the subsistence use of resources (i.e., wildlife, fish and shellfish, marine mammals, other foods, and timber resources) in the Couverden project area are minimal. There would be no direct, indirect, or cumulative effects on the abundance or distribution of subsistence resources in the project area and no adverse effects on access to, and competition for, subsistence resources in non-roaded areas. Possible adverse effects on subsistence use in roaded portions of the project area include (1) short-term restriction of access while logging is taking place, and (2) short-term increases in competition for resources associated with the potential logging camp. Mitigation would depend on how the timber sale activities are implemented, but it may include keeping the LTF and roads open for public use. However, because the Couverden project area is not an important area for deer hunting (the last documented deer harvest was in 1993), the effects of the Selected Alternative will not contribute to the overall impact on subsistence deer use over the long term. Consequently, cumulative effects from implementing the Forest Plan

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through the end of the rotation do not present a significant possibility of significant restrictions to any subsistence use in the project area.

- ♦ Streamside riparian buffers have been designed to meet or exceed requirements specified by the Forest Plan Riparian Standards and Guidelines (Forest Plan, pp. 4-53 to 4-73). The Selected Alternative does not propose new stream crossings on any Class I or II streams. Seven new stream crossings are proposed on Class III streams, and eight new stream crossings are proposed on Class IV streams.

Reasons for the Decision

In making my decision, I worked to ensure consideration of all issues and to take into account the competing interests and values of the public. There were many divergent public, personal, and professional opinions expressed during this analysis process. The decision will probably not completely satisfy any one particular group or individual. However, I considered all views, and I believe the decision I have made is a balanced approach to implementing the Tongass Forest Plan.

The Selected Alternative provides the most beneficial mix of resources for the public, within a framework of existing laws, regulations, policies, public needs and desires, and the capabilities of the land, while meeting the stated Purpose and Need for this project. Specific reasons for the decision include the following:

- ♦ My decision to implement this Selected Alternative conforms to the Forest Plan and sound national forest management. I have considered the need to help provide a sustained level of timber supply to help meet annual and Forest Plan planning cycle market demand, and to provide diverse opportunities for natural resource employment consistent with multiple use and sustained yield of all renewable forest resources. The estimated 23 mmbf of timber made available through this project would help meet Southeast Alaska timber supply needs.
- ♦ My decision also addresses a timber supply issue raised by citizens of Gustavus. A number of people expressed concern that the Couverden Timber Sale project would preclude meeting the needs of small, local mill operations. I met with concerned citizens in Gustavus on December 6, 2004. At that meeting, we agreed that initial timber sales offered from the Couverden project area would be small sales designed to satisfy the needs of small mills. Small sales are defined as less than 1 mmbf and perhaps as small as tens of thousands of board feet. I further agreed that, if successful, our program would continue to focus on meeting the needs of smaller mill operations rather than offering the entire volume from the project area in one or two large offerings. To do so would offer an amount of timber that would be far beyond the capabilities of smaller businesses. I am willing to offer small volume sales on a regular, continuing basis. While meeting the needs of smaller mills would be a priority, sales would be made available through a sealed bid process with no guarantee of success to any specific bidder.

- ♦ My decision includes provision for small sales along the existing road system. Many comments requested that small sales without the need for road construction or reconstruction be made available to local operators. Approximately 53 acres, with approximately 1 mmbf of timber, have been identified as possible small sales (based on harvest prescriptions described in Appendix 2 of the ROD and adjacency to the existing road system). My decision goes beyond considering only the small sale opportunities identified in Appendix 2. We will also look at the possibilities for offering smaller portions of other approved harvest units, dividing units based on setting boundaries, roads, and natural breaks. Our small sale program will avoid “isolation” of any suitable timber in the project area (e.g., small sale harvest along a roadside that precludes future harvest of timber further from the road except by helicopter).
- ♦ Small sales can be financially successful even though our process indicates uneconomic situations for the “normal” timber industry. Small mill operators have the ability to sell smaller amounts of forest products in the local area, have less capital outlays, lower overhead, and have been able to develop niche markets for their products. The small and very small family-owned businesses that currently constitute the Southeast Alaska woods products industry are adjusting to take advantage of these more specialized markets. This is likely a normal phenomenon that is part of the transition occurring in the Southeast Alaska timber industry.
- ♦ The vast majority of lumber products used throughout Southeast Alaska (and Alaska as a whole) is imported, primarily from Seattle by barge, and at a premium price. If local, family-owned lumber producers compete for a share of this market, they should be able to realize more positive and stable market conditions for a larger proportion of the timber available to them, especially hemlock.
- ♦ All units can be harvested using commonly available ground-based or cable-yarding systems with no requirements for helicopter yarding.
- ♦ I have carefully considered the needs of subsistence users in this decision, particularly those people residing in Hoonah and Gustavus who use the Couverden project area for subsistence resources and recreation. Throughout the planning process, the interdisciplinary team for this project has worked hard to balance a range of timber sale opportunities, while still protecting subsistence resources. I believe the Selected Alternative responds to both issues.
- ♦ None of the alternatives for the Couverden project results in a positive economic timber sale at present, except for Alternative 6 when appraised to 10-inch top. Numerous factors affect the economic viability of every timber sale, including current market conditions, cost of yarding method, and quality of wood in the project area. While it is my decision to offer the units in the Selected Alternative for a combination of small, medium, and/or large sales, timber would only be sold when market conditions improve to the

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point that the sale or sales are economical. Different management standards could be applied to any sale to improve the economics. Appraising an alternative to a 10-inch utilization standard, for example, increases expected appraisal rates.

- ♦ The Selected Alternative closes all newly constructed classified roads to normal vehicle traffic by putting them into storage. In addition, an additional 0.8 mile of existing road will be placed into storage. See Issue 1: Road Development and Access Management in Chapter 3 for more information. Temporary roads will be obliterated as part of the timber harvesting operation.
- ♦ The Selected Alternative uses an existing LTF on the Chilkat Peninsula, although some reconstruction may be required to improve operator safety. Logs would be transferred directly from pier to barge without in-water dumping or storage of logs, eliminating the potential for bark accumulation in the near-shore waters.
- ♦ Stream protection measures and Best Management Practices (BMPs) are expected to preclude measurable effects on fish habitat and water quality. Culverts on existing roads within the project area will be repaired, if needed, to provide fish passage. No new road crossings are planned on Class I or II streams (streams containing fish).
- ♦ A seasonal dock and boat ramp will be installed at the Homeshore LTF to facilitate safe public and administrative access. The dock will be removed and stored for the winter.

Significant Issues

In the following summary, I detail how significant issues are addressed within the Selected Alternative.

Significant issues for the Couverden project were identified through public and internal scoping. Similar issues were combined into one statement, where appropriate. The following five issues are within the scope of the project decision. These issues are addressed through the Proposed Action and the alternatives. Additional concerns were considered but determined not to be significant for the project decisions to be made. These concerns are either already resolved in the Forest Plan, or their resolution falls outside the scope of the Couverden project.

Issue 1: Road Construction and Timber Harvest in Roadless and Unroaded Areas

This issue relates to timber harvest and the construction of new roads in the inventoried roadless areas or in smaller unroaded areas (Figure 3-1 in the FEIS). Additional roads and harvest could result in reducing the size of specific inventoried roadless and unroaded areas in the project area.

The Selected Alternative would not build any new roads or harvest timber in the Chilkat-West Lynn Canal Inventoried Roadless Area. The Selected

Alternative balances the need to manage suitable timber lands as directed by the Forest Plan while affording greater consideration of, and protection to, roadless values.

Issue 2: Wildlife Habitat

This issue relates to cumulative effects on wildlife habitat from past, present, and proposed activities. The Forest Plan conservation biology strategy includes a forest-wide network of large, medium, and small OGRs. Timber harvest and road construction could affect corridors connecting old-growth habitat. How old-growth habitat corridors connect these reserves is an important issue.

The Homeshore drainage includes important foraging habitat for brown bears. The project area contains medium- and high-volume old-growth, which is important to many species, including goshawks, marten, and murrelets. The project area contains a small amount of high-value deer winter range. Harvest and road construction in the Homeshore drainage could adversely affect bears by altering established access routes to Homeshore Creek. Harvest of medium- and high-volume old-growth could modify important deer, goshawk, and murrelet habitat.

The Selected Alternative includes a non-significant Forest Plan amendment to enlarge the OGR in VCU 1180 (Appendix 1). This decision reflects the recommendations of an interagency review team to extend the current boundary farther up the east side of Swanson Creek along the 800-foot contour. The adjusted boundary will be 300 feet from all classified roads to reduce disturbance and exclude all young managed stands. The additional forested acreage will include high-volume old-growth stands that provide high-value deer, marten, marbled murrelet, and goshawk habitat. In addition, the Selected Alternative avoids harvest in the upper portion of the Homeshore drainage in order to preserve travel corridors for bears and other wildlife. It also avoids harvest in Unit HS8 and uses single-tree selection and group selection in Units HS5 and HS7. These three units are in important travel corridors. No harvest would take place in the 1,000-foot-wide “beach fringe,” another important travel corridor. Nearly all of the “beach fringe” is productive old-growth. The majority of the “beach fringe” is either National Forest System land or state park land and is protected from harvest.

A 500-foot buffer will be maintained along Homeshore Creek to protect an important bear feeding area. In addition, Road 8550 will be closed at the Class I stream south of Unit HS7 to reduce human/bear encounters in this area. This portion of road will be placed in storage and will not be available for normal vehicle traffic.

The Selected Alternative would harvest approximately 432 acres of high-volume old-growth and 312 acres of medium-volume old-growth. This represents approximately 1.9 percent and 1.4 percent of the existing high-volume and medium-volume old-growth forest in the project area, respectively. There would be little change in the number of deer that the project area can support, both following harvest and 25 years after harvest. Current deer density within the analysis area was calculated (using the deer

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model) at 21.5 deer per square mile. This would be reduced to 21.3 deer per square mile. This value is above the 18 deer per square mile guideline for the minimum carrying capacity to support wolves.

To assess the impacts to deer available for hunting, in addition to wolf predation, the deer model used a 36 percent reduction in calculated HSI values, which estimated a current habitat capability of 11.6 deer per square mile available for subsistence hunting within the analysis area. Using the 36 percent reduction to assess potential impacts to deer available for subsistence hunting resulted in an estimated deer density per square mile of 11.4 deer per square mile under the Selected Alternative. Based on the current level of high value deer habitat (less than 2 percent of the project area), and the low level of subsistence hunting documented within the project area (no deer have been taken since 1993 according to hunting records), the slightly reduced long-term carrying capacity is not expected to result in a significant restriction on the current pattern of subsistence uses in the project area.

Issue 3: Timber Sale Economics

This issue relates to the economic viability of proposed timber sale or sales. It also relates to the potential local employment and the revenues generated for communities in the local area. The most economical small-sale opportunities are located along the existing road system. Higher volume sales coupled with road construction may be beyond the means of smaller timber purchasers, as may harvest using helicopter or large cable yarding systems. The current value of hemlock stands in the project area is low using traditional valuation methods. Large sales may not be profitable to harvest under current market conditions.

The Selected Alternative includes several units designed for small operators, but it also has opportunities for medium and large operators. Harvesting to a 10-inch top instead of a 6-inch top would improve sale economics. Under current market conditions, only Alternative 6 when appraised to a 10-inch top has a positive economic value. Even Alternative 5, which proposed only small sales along existing roads, has a negative value. Timber would only be sold if timber values increase and/or timber harvest operational costs decrease to the point that the sale is economical.

Issue 4: Harvest Methods

Uneven-age harvest or two-age harvest systems may closely mimic natural disturbance events. Traditional clearcuts may not mimic natural disturbance events in the project area.

The Selected Alternative would implement a combination of harvest methods, including even-aged (clearcut with reserves) and two-aged tending towards uneven-aged over time (selective harvest). Approximately 631 acres would be clearcut with reserves and approximately 230 acres would be selective harvest. The selective harvest units are primarily in the Scenic Viewshed LUD, and the clearcut with reserves units are in the Timber Production LUD.

Issue 5: Scenery

This issue relates to the effects of the proposed roads and timber harvest on the scenic values of the area, particularly as viewed from Icy Strait. Icy Strait is an important travel corridor, especially for cruise ships traveling to Glacier Bay National Park. Many people commented that clearcuts detract from the scenic beauty of the area.

There would be small changes to scenery in all alternatives but they would not create enough change to cause the area to reach the threshold on unacceptable effects on scenery. Please note the photos in the scenery section. Units would barely be visible from saltwater but there would be some effect.

All units in the Selected Alternative meet or exceed the visual objectives for the project area. Figures 3-13 and 3-17 of the FEIS project the approximate effects of the Selected Alternative on the viewshed. The Selected Alternative employs various techniques, including selective harvest, patch cutting, concentrating leave trees in visible portions of units, and modifying unit boundaries to protect scenery resources in the project area. Currently, one portion of the project area exceeds the visual disturbance recommendations established by the Forest Plan. The Selected Alternative does not include any harvest units in this area and none of the selected harvest units would cause any portion of the project area to reach or exceed the recommended visual disturbance threshold.

Public Involvement

Public involvement has been instrumental in the identification and clarification of issues for this project. This has been helpful in the formulation of alternatives and has assisted me in making a more informed decision for the Couverden project. Public meetings, Federal Register notices, newspaper releases, the Tongass National Forest Schedule of Proposed Actions, group and individual meetings, and reviewing comments on the DEIS were used to gather input for this project.

The Council on Environmental Quality (CEQ) defines scoping as "...an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action" (40 CFR 1501.7). Among other things, the scoping process is used to invite public participation, to help identify public issues, and to obtain public comment at various stages of the EIS process. Although scoping began early, it is really an iterative process that continues until a decision is made. In addition to the following specific activities, the Couverden project has been listed on the Tongass National Forest Schedule of Proposed Actions and included in the Tongass National Forest 10-year Timber Sale Action Plan for several years. Both are available on the Internet (<http://www.fs.fed/r10/tongass>). To date, the public has been invited to participate in the project in the following ways:

- ♦ **Notice of Intent:** A Notice of Intent was published in the Federal Register on July 23, 2002, when it was decided that an EIS was to be undertaken for the project.

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- ♦ **Public Mailing:** In August 2002, a letter providing information and seeking public comment was mailed to over 300 individuals and groups that had previously shown interest in Forest Service projects in Southeast Alaska. This included federal and state agencies, Alaska Native groups, municipal offices, businesses, interest groups, and individuals. A total of 53 responses to this initial mailing were received.
- ♦ **Local Media:** Announcements about the project were printed in the Juneau Empire.
- ♦ **Open Houses:** Open house public meetings were held in Juneau (August 26, 2002), Hoonah (August 27, 2002), and Gustavus (August 28, 2002) to provide project area information, present the proposed action, and discuss local concerns and interests that should be addressed in the Couverden project analysis. Approximately 25 people attended these meetings, and more than 50 commented on the proposed project. While some comments supported the proposed timber sale, many expressed concerns about additional road construction, uneconomic timber harvest, disturbance to scenery and wildlife, and clearcutting as a harvest method.
- ♦ **Meetings with Alaska Native Tribes:** The Juneau District Ranger and other Forest Service staff discussed the project with representatives of the Hoonah Indian Association on August 27, 2002, and with the Douglas Indian Association on September 12, 2002. Neither Indian association provided comments.

On April 10, 2003, the Forest Service forwarded a copy of the report for heritage resources for the proposed Couverden Timber Sale to the Hoonah Indian Association. Further consultation with the Hoonah Indian Association was held on March 15, 2004, at the Hoonah District Office.

ANILCA substance hearings were held in Hoonah and Gustavus on March 17 and 18, 2004. Transcripts of these hearings are included in Appendix E of the FEIS.

- ♦ **Meetings with Agencies, Communities, and Others:** Forest Service staff met with representatives from the Alaska Department of Fish and Game (ADF&G) and the U.S. Fish and Wildlife Service (USFWS) to evaluate the adequacy of the small old-growth reserve in the project area. USFWS, Alaska Office of Project Management and Permitting, and ADF&G provided comments. They expressed concerns about effects on fish and wildlife, water quality, and road construction.

On December 6, 2004, I met with representatives of the Gustavus Community Organization, small sawmill owners from the Gustavus area, and other interested residents at Gustavus Community Hall to discuss the proposed Couverden Timber Sale Project. Concern was expressed that the total size of the project (proposed action greater than 20 mmbf) would mean a lack of small volume timber sales from

the project area. There was a fear that small mills in Gustavus would have no timber supply in the future.

- ♦ **Public Comments Received in Response to the DEIS:** The DEIS was published on December 2, 2003, and distributed to approximately 500 individuals, agencies, and organizations. Public meetings were held in Juneau (March 16, 2004), Hoonah (March 17, 2004), and Gustavus (March 18, 2004). In addition, the Gustavus Community Organization held a meeting on the Couverden project and other Tongass issues and submitted a transcript of the discussions at that meeting. The public comment period for the Couverden Timber Harvest DEIS ended on March 29, 2004. Over 70 letters were received during the comment period for the DEIS. Each of these letters and the responses to them are included in the FEIS (Appendix E).
- ♦ **Analysis and Incorporation of Public Comments:** Public comments and subsistence comments have been analyzed and incorporated into the FEIS. For an analysis of public comment and the Forest Service response to public comment, see Appendix E of the FEIS.

The FEIS will be filed with the U.S. Environmental Protection Agency (EPA) and will be available for public review.

Coordination With Other Agencies

From the time scoping was initiated, meetings with all interested state and federal agencies have occurred. Issues were discussed and information was exchanged. Personnel from the Alaska Department of Natural Resources, Office of Project Management and Permitting, ADF&G, Alaska Department of Environmental Conservation, and the USFWS were consulted on the project during the environmental analysis. The Alaska Coastal Management Plan (ACMP) consistency review process was initiated upon publication of the DEIS through the Office of Project Management and Permitting.

A Biological Assessment was prepared and sent to the National Marine Fisheries Service (NOAA Fisheries) as part of the Section 7 consultation process under the Endangered Species Act.

Consultation with the USFWS and ADF&G resulted in the recommendation of adjustments to the small OGR in VCU 1180.

The FEIS identifies the agencies that were informed of and/or involved in the planning process (see *Distribution List* in Chapter 4 of the FEIS).

Alternatives

Alternatives Considered in Detail

Six alternatives were considered in detail in the FEIS. Each action alternative is consistent with the Forest Plan. For a comparison of the alternatives, refer to Chapter 2 of the FEIS.

Alternative 1

This alternative proposes no new timber harvest or road construction in the Couverden project area at this time. It does not preclude timber harvest from other areas at this time, or from the Couverden project area at some time in the future. The CEQ regulations (40 CFR 1502.14d) require that a “no action” alternative be analyzed in every EIS. This alternative represents the existing condition against which the other alternatives are compared. This alternative would respond to the issues of scenic quality, recreation value, roadless character, and wildlife habitat protection, including old-growth forests, by not building roads or harvesting timber at this time. However, this alternative would not respond to the issue of providing employment and contributing to the local economy and would not contribute saw timber or other wood products to meet the demand for Tongass National Forest timber as described in the Purpose and Need (Chapter 1 of the FEIS). Under this alternative, the small OGR located in VCU 1180 would remain as mapped in the Forest Plan. The Alternative 1 (Existing Condition) map (FEIS Figure 2-1) shows the distribution of vegetation and the small OGRs associated with no new timber harvest. Existing roads would remain open and would be available for off-highway vehicle (OHV) use.

Alternative 2

Alternative 2 emphasizes economic timber harvest and road construction within the constraints of the Forest Plan Standards and Guidelines. The majority of units would have a clearcut with reserves prescription using cable yarding systems. Some units would be helicopter yarded. There would also be some single-tree selection and group selection in areas designated as partial retention VQO. Alternative 2 is included to show the full range of effects that could result from implementing the 1997 Forest Plan similar to how it was modeled in the 1997 FEIS.

Alternative 2 emphasizes timber production to the extent compatible with Forest Plan Standards and Guidelines, harvesting approximately 27 mmbf of timber on approximately 978 acres, the highest harvest volume of all the alternatives. This alternative would contribute to the Forest Service’s attempt to seek to meet market demand while being consistent with the Tongass Forest Plan and the Standards and Guidelines for all resources. Alternative 2 includes 4.3 miles of new classified road construction (1.6 miles of which would be on the roadbeds of old unclassified roads) and 3.5 miles of temporary road. The timber proposed for sale under Alternative 2 could be offered as one or more sales and would offer opportunities for timber harvesting by local operators, responding to the issue of providing employment and contributing to the local economy. This alternative would also help move the project area towards the desired future condition of the Forest Plan by converting old-growth stands to young-growth. This alternative does not respond to issues related to road construction on roadless and unroaded areas (i.e., recreation value), and it does not respond

to the scenic quality issues as well as the other alternatives. It does address the issue of wildlife habitat protection by closing all new roads to normal motorized vehicles after completion of harvest activities and by enlarging the small OGR in VCU 1180 from 1,469 acres to 2,259 acres. Except for 0.8 mile of the 8550 road, existing roads would remain open and would be available for OHV use.

Alternative 3

Alternative 3 would avoid road construction and timber harvest in roadless or unroaded areas. In other respects, it would implement timber harvest and new road construction according to 1997 Forest Plan Standards and Guidelines to meet resource management objectives. Harvest prescriptions would include a mixture of clearcut with reserves and single-tree selection and group selection in areas designated as partial retention VQO. No units would be helicopter yarded.

Alternative 3 would harvest approximately 20 mmbf of timber on approximately 759 acres. The timber proposed for sale in Alternative 3 could be offered as one or more sales, responding to the issue of providing employment and stimulating the local economy. It would also help move the project area towards the desired future condition of the Forest Plan by converting old-growth stands to young-growth. Alternative 3 includes 3.4 miles of new classified road construction (1.6 miles of which would be on the roadbeds of old unclassified roads) and 3.5 miles of temporary road. This alternative employs single-tree selection and group selection prescriptions in the Scenic Viewshed LUD, but more harvested acres would be visible from Key Viewing Areas (KVAs) (FEIS Figure 3-10) under this alternative than under all other alternatives, except Alternative 2. As in the other action alternatives, wildlife habitat protection would be addressed by closing all new roads to normal motorized vehicles after the completion of harvest activities and enlarging the small OGR in VCU 1180 from 1,469 acres to 2,259 acres. Except for 0.8 mile of the 8550 road, existing roads would remain open and would be available for OHV use.

Alternative 4

Alternative 4 would avoid harvest in areas visible from KVAs and limit new road construction, responding to the issue of scenic quality and construction of new roads in the roadless and unroaded areas. This alternative does not respond to the harvest method issue because all units would have a clearcut with reserves prescription except for one small unit in an area designated as partial retention, which would have a single-tree selection and group selection prescription. The majority of units would use cable-yarding systems, but some units would be helicopter yarded.

Alternative 4 would harvest approximately 15 mmbf of timber on approximately 566 acres. The timber proposed for harvest in Alternative 4 could be offered as one or more sales and would be available for timber harvest by local operators, responding to the issue of providing employment and stimulating the local economy. It would also help move the project area towards the desired future condition of the Forest Plan by converting old-growth stands to young-growth. Only classified roads that would follow an existing unclassified roadbed and temporary roads would be built. There would be no road construction or timber harvest in roadless or unroaded

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areas, minimizing adverse effects on recreation, scenic quality, and wildlife habitat. In other respects, it would implement timber harvest and new road construction according to 1997 Forest Plan Standards and Guidelines to meet resource management objectives. After completion of harvest activities, all new roads would be closed to normal vehicle use. Except for 0.8 mile of the 8550 road, existing roads would remain open and would be available for OHV use. As in the other action alternatives, the small OGR in VCU 1180 would be enlarged from 1,469 acres to 2,259 acres.

Alternative 5

Alternative 5 would harvest up to 5 mmbf of timber on up to approximately 367 acres and would only harvest areas within 500 feet of an existing open road. This alternative would seek to make 100 mbf to 500 mbf of timber available to local operators each year for 10 years. Additionally, all harvest would be selective harvest, which addresses harvest method and scenic quality issues. Under this alternative, no new roads would be constructed and no closed roads would be re-opened, responding to roadless, recreation, and wildlife habitat protection issues. Except for 0.8 mile of the 8550 road, existing roads would remain open and would be available for OHV use. As in the other action alternatives, the small OGR in VCU 1180 would be enlarged from 1,469 acres to 2,259 acres. This alternative is based on recommendations provided by residents of Gustavus.

Alternative 6

Alternative 6 seeks to provide an economical timber harvest with limited road construction. All units would be harvested using a clearcut with reserves prescription and a cable logging system, but it harvests the fewest acres of all the alternatives. Alternative 6 would harvest approximately 6 mmbf on approximately 172 acres. Only classified roads that would follow an existing unclassified roadbed and temporary roads would be built. There would be no road construction or timber harvest in roadless or unroaded areas. Except for 0.8 mile of the 8550 road, existing roads would remain open and would be available for OHV use.

Timber proposed for sale in Alternative 6 could be offered as one or more sales, and would provide opportunities for timber harvesting by local operators, contributing to the local economy. It would also help move the project area towards the desired future condition of the Forest Plan by converting old-growth stands to young-growth. This alternative would harvest the fewest acres in areas visible from KVAs and would leave residual trees in visible areas to limit adverse effects to scenery. To address the issue of wildlife habitat protection, all new roads would be closed to normal vehicle use after harvest activities are completed and the small OGR in VCU 1180 would be enlarged from 1,469 to 2,259 acres, as in the other action alternatives.

Environmentally Preferred Alternative

Based on a comparison of all the alternatives and the discussion contained within Chapter 3 of the FEIS, Alternative 1, the no action alternative, would cause the least environmental disturbance. All the alternatives considered in detail have varying levels of environmental effects, depending on the emphasis of the alternative. Implementation of Alternative 5 would cause

the least adverse environmental effects of all the action alternatives because it constructs no new roads and harvests the least amount of timber.

Alternatives Not Considered in Detail

In addition to the alternatives described above, several more alternatives were considered during the analysis, but they have not been included in the EIS for detailed study. These alternatives were discussed during the development of the alternatives. These are described briefly below, along with the reasons for not considering them further.

An alternative that only included helicopter yarding was considered but eliminated because of the high cost, and because other alternatives were considered with little or no new road construction using less expensive yarding methods.

The proposed action originally considered several additional units. Four proposed units in the Homeshore watershed were dropped from consideration because they are used by brown bears to reach important foraging habitat in and along Homeshore Creek. Harvest in these units will be delayed until forest in adjacent areas has matured to the point that it can provide alternate travel corridors for the bears. Several units were also determined to be either uneconomical to harvest at this time or are not suitable for timber management.

Planning Record

The planning record for this project includes the DEIS, FEIS, material incorporated by reference, and materials and data that support the analysis on which the decision is based. An electronic copy of the planning record is available upon request from the Juneau Ranger District.

Mitigation

Mitigation measures are prescribed to avoid, reduce, minimize, or eliminate the adverse effects of actions. These measures were applied in the development of the project alternatives, including the Selected Alternative, and in the design of the harvest units and road corridors. The *Mitigation Measures* section of Chapter 2 and Appendix D of the FEIS, and Appendix 2 of this ROD discuss mitigation measures.

Mitigation measures applicable to the Selected Alternative include measures contained in the Standards and Guidelines of the Forest Plan and applicable Forest Service Manuals and Handbooks. The FEIS includes site-specific mitigation measures described in Chapter 2, on unit and road cards in Appendices B and C, and in Appendix D of the EIS. These measures are adopted as part of this decision and will be implemented. Measures to avoid or minimize adverse environmental effects of the project have been incorporated into the Selected Alternative (refer to the unit and road cards in ROD Appendix 2).

Monitoring

A monitoring program is the process by which the Forest Service can evaluate whether the resource management objectives of the final environmental documents have been implemented as specified and whether the steps identified for mitigating the environmental effects were effective. Project level monitoring is specified in Chapter 2 of the FEIS and will include implementation monitoring for all BMPs. These monitoring items are part of this decision and will be implemented.

Each monitoring item describes the objective of the monitoring, what will be done, and how it will be done. Monitoring activities may reveal results that deviate from planned effects, in which case corrective actions are prescribed. The Juneau District Ranger is responsible for ensuring that project implementation, mitigation, monitoring, and enforcement are accomplished as specified in the FEIS.

Findings Required By Law

National Forest Management Act

The National Forest Management Act (NFMA) requires specific determinations in this ROD: consistency with existing Forest Plans and FSM 2410.3, R10 Supp. 2400-2002-1 (5/7/2002), a determination of clearcutting as the optimal method of harvesting, if used, and specific authorizations to create openings over 100 acres in size. Specific information and rationale used to develop unit prescriptions is shown on unit cards (Appendix 2 of the ROD), in Chapter 3 of the Final EIS, and in the planning record.

Clearcutting as the Optimal Method of Harvesting

The Forest Plan (p. 4-96 to 4-97) and Forest Plan EIS (Appendix G, p. G-7 to G-9) give guidance on when to use even-aged management. Clearcutting (an even-aged method) is used in this project to preclude or minimize the occurrence of potentially adverse impacts from windthrow. It is applied where windthrow potential is moderate to high. Clearcutting is also used to minimize mistletoe infestations, logging damage, or other factors affecting forest health. Specific information and rationale for use of this prescription is shown in the introduction to the unit cards and in the silvicultural prescriptions on the individual unit cards (Appendix 2 of this ROD), and in Chapter 3 of the FEIS. Where used, this prescription has been deemed optimal related to site-specific considerations as described above.

Tongass Land and Resource Management Plan

This decision fully complies with the Forest Plan for the Tongass National Forest. I have reviewed the management direction, standards and guidelines, and the schedule of activities for the project area included in the Selected Alternative, and find the Selected Alternative to be consistent with these elements. The activities authorized in this decision are consistent with

the standards and guidelines and management prescriptions of the Forest Plan.

Forest Service Transportation Final Administrative Policy (Roads Rule)

The Couverden Timber Sale FEIS and this ROD have been prepared to be consistent with the Forest Service Transportation Final Administrative Policy, the Tongass National Forest Level Road Analysis (January 2003), and the Couverden Roads Analysis.

Harvest Openings Larger than 100 Acres

There are no harvest openings larger than 100 acres proposed for this project.

Tongass Timber Reform Act

Forest Plan Riparian Standards and Guidelines have been applied to the Couverden project, and no commercial timber harvest will occur within 100 feet of any Class I stream or any Class II stream flowing directly into a Class I stream, as required in Section 103 of the Tongass Timber Reform Act. The design and implementation direction for the Selected Alternative incorporates BMPs and Forest Plan Standards and Guidelines for the protection of all stream classes.

Endangered Species Act

Actions authorized in the Selected Alternative are not anticipated to have a direct, indirect, or cumulative effect on any threatened or endangered species in or outside the Couverden Timber Sale project area. NOAA Fisheries has concurred that the actions described for the proposed project are not likely to adversely affect any aquatic threatened or endangered species. A complete Biological Assessment for marine threatened and endangered species is included in the planning record for this project. Consultation was done with the USFWS and no terrestrial threatened or endangered species are known to occur in the Couverden Timber Sale project area. I have determined that this action will not have any adverse impacts on any threatened or endangered species.

Bald Eagle Protection Act

A Memorandum of Understanding (MOU) between the Forest Service and the USFWS to facilitate compliance with the Bald Eagle Protection Act restricts management activities within 330 feet of an eagle nest site. The Selected Alternative is not anticipated to have a significant direct, indirect, or cumulative effect on any bald eagle habitat.

Magnuson-Stevens Fishery Conservation and Management Act (Essential Fish Habitat)

The Magnuson-Stevens Fishery Conservation and Management Act requires a determination on the effects of the Couverden Timber Sale project on Essential Fish Habitat. The potential effects of the project on Essential Fish Habitat are discussed in Chapter 3 of the FEIS. This discussion includes a description of the Essential Fish Habitat in the project area, a description of the proposed activities, and a description of the proposed mitigation measures that will be implemented to protect these essential habitats.

The descriptions and the analysis lead me to determine that the Couverden Timber Sale may adversely affect Essential Fish Habitat, but this risk will be minimized or avoided through the implementation of Forest Plan Standards and Guidelines and BMPs.

In accordance with the agreement of August 25, 2000, between the Forest Service and NOAA Fisheries for consultation on Essential Fish Habitat, the Draft EIS was provided to NOAA Fisheries to initiate formal consultation. NOAA Fisheries did not respond to the discussion or the determination in the DEIS during the comment period. Formal Essential Fish Habitat consultation process was satisfied through a letter dated January 7, 2003, in accordance with the agreement between NOAA Fisheries and the Forest Service. This letter was the Forest Service's response to NOAA Fisheries' conservation recommendations.

National Historic Preservation Act

Heritage resource surveys of various intensities have been conducted in the project area, following inventory protocols approved by the Alaska State Historic Preservation Officer. The State Historic Preservation Officer has been consulted, in accordance with Section 106 of the National Historic Preservation Act (NHPA) and 36 CFR Part 800. I have determined that there will be no effects on known heritage resources.

Native communities have been contacted and public comment encouraged. Copies of the heritage resource surveys were sent to the Hoonah Indian Association. The Forest Service has satisfied the consultation process with the State Historic Preservation Officer. Forest Service timber sale contracts contain enforceable measures for protecting any undiscovered heritage resource that might be encountered during sale operations. See discussion under Heritage Resources in Chapter 3 of the FEIS.

Federal Cave Resource Protection Act of 1988

The actions in the Selected Alternative will not have a direct, indirect, or cumulative effect on any significant cave in the Couverden Timber Sale project area. No units in the Selected Alternative are in areas that contain karst resources.

Alaska National Interest Lands Conservation Act Section 810, Subsistence Evaluation and Findings

An Alaska National Interest Lands Conservation Act (ANILCA) Section 810 subsistence evaluation was conducted for the alternatives considered in detail. The Juneau District Ranger and other Forest Service staff discussed the project with representatives of the Hoonah Indian Association on August 27, 2002, and with the Douglas Indian Association on September 12, 2002. No comments were received. Subsistence hearings were held in Hoonah (March 17, 2004) and in Gustavus (March 18, 2004) to collect public input on subsistence users in the project area. A transcription of their testimony is included in Appendix E of the FEIS.

The review of the subsistence hearing testimony, comments from the public, and the analysis conducted for the FEIS indicate that there will not be a significant possibility of a significant restriction on subsistence uses of wildlife, fish, shellfish, marine mammals, other foods, or timber resources as a result of this sale. Although some short-term access restrictions and competition may occur during timber harvest, these are not expected to be significant. The Couverden project area is not a major deer hunting area; therefore, the effects of the Selected Alternative are not likely to contribute to the overall impact on subsistence deer use over the long term. (See the Subsistence Report in the project planning record.)

Clean Water Act (1977, as amended)

Congress intended the Clean Water Act of 1972 (Public Law 92-500), as amended in 1977 (Public Law 95-217) and 1987 (Public Law 100-4), to protect and improve the quality of water resources and maintain their beneficial uses. Section 313 of the Clean Water Act and Executive Order 12088 of January 23, 1987 address federal agency compliance and consistency with water pollution control mandates. Agencies must be consistent with requirements that apply to “any governmental entity” or private person. Compliance is to be in line with “all Federal, State, interstate, and local requirements, administrative authority, and process and sanctions respecting the control and abatement of water pollution.”

The Clean Water Act (Sections 208 and 319) recognized the need for control strategies for non-point source pollution. The National Non-point Source Policy (December 12, 1984), the Forest Service Non-point Strategy (January 29, 1985), and the USDA Nonpoint Source Water Quality Policy (December 5, 1986) provide a protection and improvement emphasis for soil and water resources and water-related beneficial uses. Soil and water conservation practices (BMPs) were recognized as the primary control mechanisms for non-point source pollution on National Forest System lands. EPA supports this perspective in their guidance, Non-point Source Controls and Water Quality Standards (August 19, 1987).

The Forest Service must apply BMPs that are consistent with the Alaska Forest Resources and Practices Regulations to achieve Alaska Water

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Quality Standards. The site-specific application of BMPs, with a monitoring and feedback mechanism, is the approved strategy for controlling non-point source pollution as defined by Alaska's Non-point Source Pollution Control Strategy (October 2000). In 1997, the State approved the BMPs in the Forest Service's Soil and Water Conservation Handbook (FSH 2509.22, October 1996) as consistent with the Alaska Forest Resources and Practices Regulations. This Handbook is incorporated into the Tongass Land and Resource Management Plan.

A discharge of dredge or fill material from normal silviculture activities, such as harvesting for the production of forest products, is exempt from Section 404 permitting requirements in waters of the United States, including wetlands (404)(f)(1)(A). Forest roads qualify for this exemption only if they are constructed and maintained in accordance with best management practices to ensure that flow and circulation patterns and chemical and biological characteristics of the waters are not impaired (404)(f)(1)(E). The BMPs that must be followed are specified in 33 CFR 323.4(a). These specific BMPs have been incorporated into the Forest Service's Soil and Water Conservation Handbook under BMP 12.5. The design of harvest units for the Selected Alternative was guided by standards, guidelines, and direction contained in the Forest Plan, and applicable Forest Service Manuals and Handbooks. The unit cards and road cards (Appendix 2 of the ROD) contain specific details on practices prescribed to prevent or reduce non-point sediment sources.

Monitoring and evaluation of the implementation and effectiveness of Forest Plan Standards and Guidelines and BMPs will occur. Project activities are expected to meet all applicable State of Alaska Water Quality Standards Regulations.

Clean Air Act

Emissions anticipated from the implementation of any project alternative will be of short duration and are not expected to exceed State of Alaska ambient air quality standards (18 Alaska Administrative Code [AAC] 50).

Coastal Zone Management Act

The Coastal Zone Management Act of 1972 (CZMA), while specifically excluding federal lands from the coastal zone, requires that a federal agency's activities be consistent with the enforceable standards of a state's coastal management program to the maximum extent practicable when the agency's activities affect the coastal zone.

I have determined that the Couverden Timber Sale project may affect the coastal zone, and that those Forest Plan Standards and Guidelines and mitigation measures applicable to the Couverden Timber Sale project meet or exceed the requirements of the State of Alaska Coastal Zone Management Plan. Therefore, the project is consistent to the maximum extent practicable with the enforceable policies of the Alaska Coastal Zone Management Program.

The Alaska Coastal Zone Management Plan consistency review process was initiated upon publication of the DEIS. The Alaska Department of Environmental Conservation reviewed the DEIS and responded with a letter (dated March 10, 2004) concurring with the Forest Service's consistency determination for the project (refer to Appendix E of the FEIS).

Executive Orders

Executive Order 11988 (Floodplains)

Executive Order 11988 directs federal agencies to take action to avoid, to the extent practicable, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains.

Executive Order 11990 (Wetlands)

Executive Order 11990 requires federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with the destruction or modification of wetlands. Because wetlands are so extensive in the Couverden Timber Sale, it is not feasible to avoid all wetland areas. Wetland soils not meeting Forest Plan criteria for timber harvest suitability are excluded from the harvest base. Soil moisture regimes and vegetation on some wetlands may be altered in some harvest units; however, the affected wetlands will meet wetland classification and will still function as wetlands in the ecosystem.

Road construction across wetlands is permitted within Alaska. Such construction requires the filling-in of wetlands and creates permanent loss of wetland habitat. Effects to wetlands are minimized through the application of specific BMPs. Road construction through wetlands is avoided where possible. See Chapter 3, Wetlands, of the FEIS for more extensive discussion of the wetlands.

Executive Order 12898 (Environmental Justice)

Executive Order 12898 directs federal agencies to identify and address the issue of environmental justice, i.e., human health and environmental effects of agency programs that disproportionately impact minority and low-income populations. The Executive Order specifically directs agencies to consider patterns of subsistence hunting and fishing when an agency action may affect fish or wildlife. Implementation of the Selected Alternative will not cause disproportionate adverse environmental effects to minority or low-income populations in the Couverden area.

Executive Order 12962 (Recreational Fisheries)

Executive Order 12962 requires federal agencies to evaluate the effects of proposed activities on aquatic systems and recreational fisheries. With the application of Forest Plan Standards and Guidelines, including those for riparian areas, no significant adverse effects to freshwater or marine resources will occur. Aquatic systems would remain essentially the same

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because aquatic habitats are protected through implementation of BMPs and riparian buffers. Under the Selected Alternative, post-project road closures could limit foot or bicycle access to some recreational fishing opportunities. However, most recreational fishing around the Couverden project area occurs by boat in saltwater, and any adverse effects would be minimal.

Executive Order 13007 (Indian Sacred Sites)

Executive Order 13007, Indian Sacred Sites, provides presidential direction to federal agencies to give consideration to the protection of American Indian sacred sites and to allow access where feasible. In a government-to-government relationship, the tribal government is responsible for notifying the agency of the existence of a sacred site. A sacred site is defined as a site that has sacred significance due to established religious beliefs or ceremonial uses, and which has specific, discrete, and delineated location, which has been identified by the tribe. Members of the Tongass National Forest staff and the interdisciplinary team met with representatives of the Hoonah Indian Association on August 27, 2002 and March 15, 2004, and with the Douglas Indian Association on September 12, 2002. No specific sacred site locations have been identified in the project area by tribal governments or their authorized representatives.

Executive Order 13186 (Migratory Birds)

The Migratory Bird Treaty Act of 1918 (amended in 1936 and 1972) prohibits the taking of migratory birds, unless authorized by the Secretary of Interior. The law provides the primary mechanism to regulate waterfowl hunting seasons and bag limits, but its scope is not limited to waterfowl. Over 100 species of birds migrate from other states and countries to Alaska to breed, nest, and fledge their young. Most of these birds fly to interior or northern Alaska, and only pass through the project area on the way to their breeding grounds. The migratory species that may stay in the area utilize most, if not all, of the habitats described in the analysis for breeding, nesting, and raising their young. The effects on these habitats were analyzed for this project.

None of the action alternatives is anticipated to have a significant direct, indirect, or cumulative effect on any migratory bird species for this project area. There may be direct minor effects on individuals or small groups and their nests from the harvest of timber or the disturbance caused by harvest activities.

Federal and State Permits

Federal and state permits necessary to implement the authorized activities are listed in Chapter 1 of the FEIS.

Implementation Process

Implementation of this decision may occur no sooner than 50 days following publication of the legal notice of the decision in the Juneau Empire, published in Juneau, Alaska.

This project will be implemented in accordance with Forest Service Manual (FSM) and Handbook direction for Timber Sale Project Implementation in FSM 2431.3 and FSH 2409.24. This direction provides a bridge between project planning and implementation and will ensure execution of the actions, environmental standards, and mitigation approved by this decision, and compliance with TTRA and other laws. All applicable BMPs will be applied to the Selected Alternative.

Implementation of all activities authorized by this ROD will be monitored to ensure that they are carried out as planned and described in the FEIS.

Appendix 2 of this ROD contains the Selected Alternative's unit and road cards. These cards are an integral part of this decision because they document the specific resource concerns, management objectives, and mitigation measures to govern the layout of the harvest units. These cards will be used during the implementation process to ensure that all aspects of the project are implemented within applicable standards and guidelines and that resource impacts will not be greater than those described in the FEIS. Similar cards will be used to document any changes to the planned layout as the actual layout and harvest of the units occur with project implementation.

The implementation record for this project will display:

- ♦ Each harvest unit as actually implemented;
- ♦ Any proposed changes to the design, location, or other mitigation measures for the project; and
- ♦ Authorization of the proposed changes.

Procedure for Changes During Implementation

Proposed changes to the authorized project actions will be subject to the requirements of NEPA, NFMA, Section 810 of ANILCA, TTRA, CZMA, and other laws concerning such changes.

In determining whether and what kind of NEPA action is required, the Forest Supervisor will consider the criteria set forth in the Code of Federal Regulations (40 CFR 1502.9(c)), and FSH 1909.15, sec. 18, for determining whether to supplement an existing EIS. In particular, the Forest Supervisor will determine whether the proposed change is a substantial change to the Selected Alternative as planned and already approved, and whether the change is relevant to environmental concerns. Connected or interrelated proposed changes regarding particular areas of specific activities will be considered together in making this determination. The cumulative effects of these changes will also be considered.

The intent of field verification is to confirm inventory data and to determine the feasibility and general design and location of a unit or road, but not to locate final boundaries or road locations. Minor changes are expected during implementation to better meet on-site resource management and protection objectives. Minor adjustments to unit boundaries are also likely

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during final layout for the purpose of improving logging system efficiency. This will usually entail adjusting the boundary to coincide with logical logging setting boundaries. Many of these minor changes will not present sufficient potential effects to require any specific documentation or other action to comply with applicable laws. Some minor changes may still require appropriate analysis and documentation to comply with FSH 1909.15, sec. 18.

Right to Appeal

This decision is subject to administrative appeal. Organizations or members of the general public may appeal this decision according to Title 36 CFR part 215. The appeal must be filed within 45 days of the date that legal notification of this decision is published in the *Juneau Empire*, the official newspaper of record. The written Notice of Appeal must be filed with:

Regional Forester, Alaska Region
U.S. Department of Agriculture, Forest Service
P.O. Box 21628
Juneau, AK 99802-1628

It is the responsibility of those who appeal a decision to provide the Regional Forester with sufficient written evidence and rationale to show why the decision by the Forest Supervisor should be changed or reversed. This written Notice of Appeal must:

- ♦ State that the document is a Notice of Appeal filed pursuant to 36 CFR Part 215;
- ♦ List the name, address, and, if possible, the telephone number of the appellant;
- ♦ Identify the decision document by title and subject, date of the decision, and name and title of the Responsible Official;
- ♦ Identify the specific change(s) in the decision that the appellant seeks or portion of the decision to which the appellant objects;
- ♦ State how the Responsible Official's decision fails to consider comments previously provided, either before or during the comment period specified in 36 CFR 215.6 and, if applicable, how the appellant believes the decision violates law, regulation, or policy.

For additional information concerning this decision, contact Dave Carr, Couverden Project Coordinator, Tongass National Forest, Juneau Ranger District, 8465 Old Dairy Road, Juneau, AK 99801-8041, or call (907) 790-7402.



FORREST COLE
Forest Supervisor

7.15.05

Date

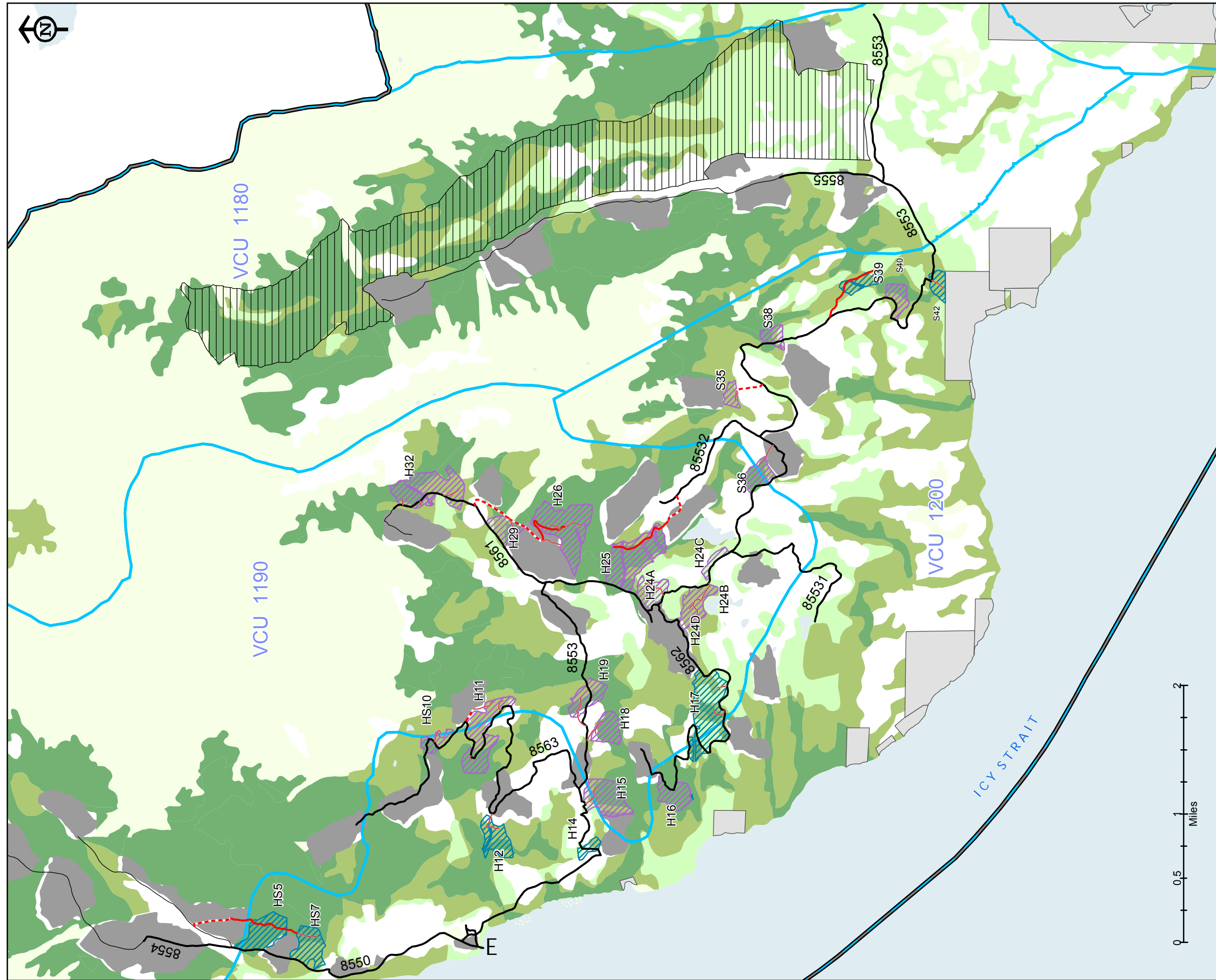
Table R-1. Selected Alternative

Effect	Selected Alternative
Issue 1. Roadless and Unroaded Areas	
Harvest acres within the IRA #304 (Roadless Rule)	0
Miles of new road in the IRA (Roadless Rule)	0
Acres that would be more than 600/1200 feet from harvest unit/road	177
Harvest within unroaded areas (acres)	58
Miles of new road in unroaded areas	0.2
Issue 2. Wildlife Habitat	
Adjustments to the small OGR (acres)	790
Acres of productive old forest harvested	
High	432
Medium	312
Low	90
Acres of non-productive and non-forest included in units	27
Deer per square mile after harvest	21.3
Deer per square mile after 25 years	21.2
High-value marten habitat harvested (acres)	369
Road density (miles/square mile)	
VCU 1170	0
VCU 1180	0.29
VCU 1190	0.83
VCU 1200	1.15
Total project area	0.56
Issue 3. Timber Sale Economics	
Total harvest volume (mmbf)	23
Total harvest volume (ccf)	4,600
Average harvest cost (\$/mbf)	239.48
Average harvest cost (\$/ccf)	119.74
Net stumpage value (\$/mbf)	-54.24
Net stumpage value (\$/ccf)	-27.12
Employment (job-years)	122
Issue 4. Harvest Methods	
Clearcut with reserves (acres)	631
Single tree and group selection (acres)	230
Percent single tree and group selection	29
Issue 5. Scenery	
Harvest areas visible from KVAs (acres)	370
Other Environmental Considerations	
Soils	
Harvest-related soil disturbance (acres)	48
Miles of new classified road	3.8
Miles of new temporary road	3.6
Miles of road reconstruction	0
Road/landing-related disturbance (acres)	62

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Table R-1. Selected Alternative (continued)

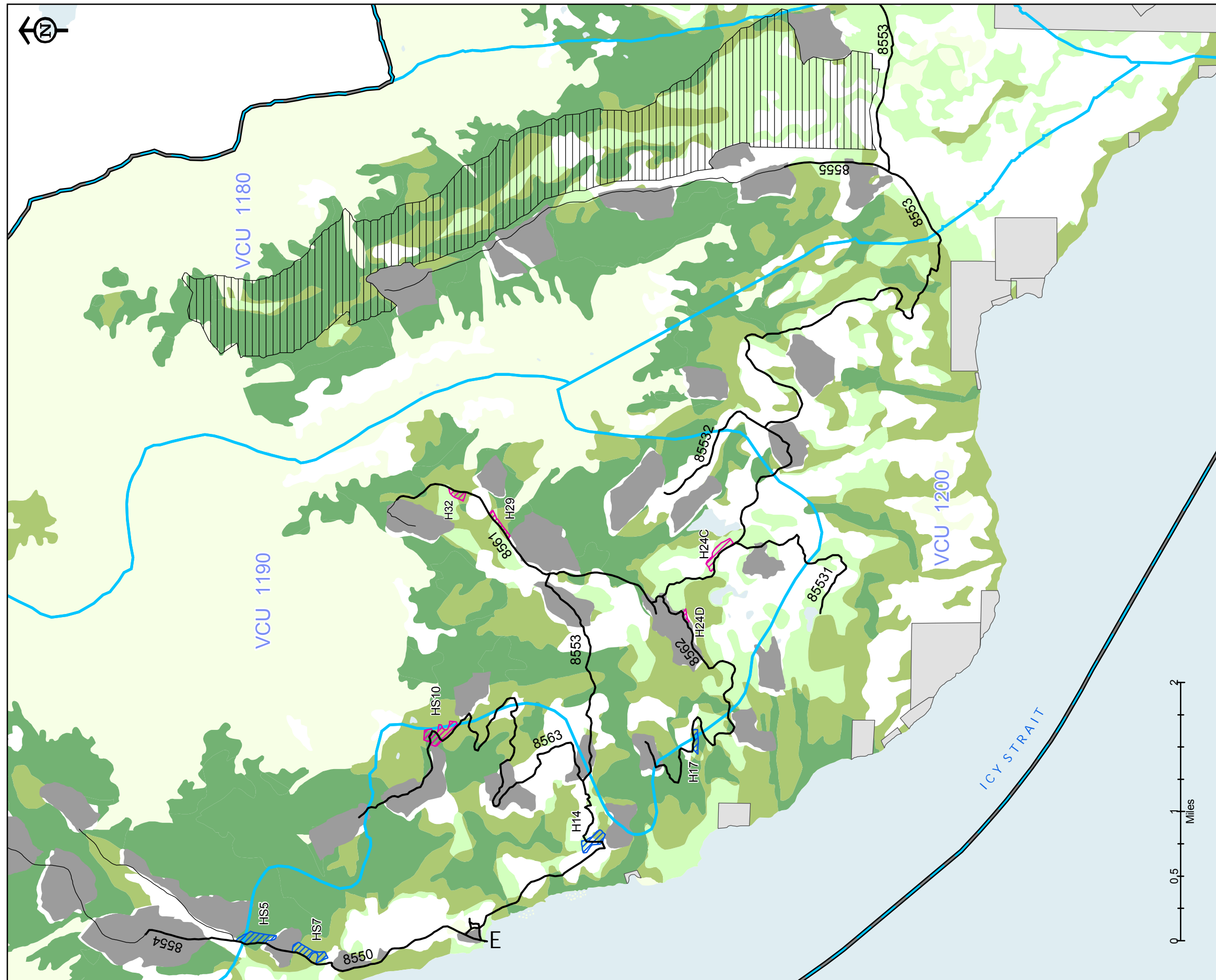
Effect	Selected Alternative
Watershed and Fisheries	
Percent cumulative disturbance	
Homeshore watershed	9.6
North Group drainage area	8.7
Humpy watershed	15.7
South Group drainage area	8.0
Swanson watershed	3.5
Cumulative road/stream crossings	
Class I	7
Class II	9
Class III	44
Class IV	40
Wetlands	
Wetlands acres clearcut	66
Wetland acres partial cut	11
Classified roads in wetlands (acres)	<0.25
Temporary roads in wetlands (acres)	6.2
Cumulative wetlands affected (acres)	412
Recreation	
Net change in ROS settings	
Primitive	0
Semi-primitive Non-motorized (SPNM)	-769
Semi-primitive Motorized (SPM)	-299
Road Non-modified (RN)	0
Roaded Modified (RM)	1,068
Notes:	
Refer to Table 2-6 of the FEIS for a comparison to other alternatives.	
Refer to Chapter 3 for details and explanations.	
Numbers, including totals, are not exact due to rounding.	



Legend

- LTf - Log Transfer Facility
- Road Number
- 8553
- Existing Classified Road (ML1)
- Existing Classified Road (ML2)
- Proposed Classified Road
- Proposed Temporary Road
- Proposed Classified New Construction
- On Pre-existing Road Bed
- VCU Boundary
- Project Boundary
- Old Growth Reserve
- Previous Harvest
- Non-NFS Land
- Water Body
- Volume Strata
 - High
 - Medium
 - Low
- Non-Forest
- Proposed Silvicultural Prescription
 - Clear Cut with Reserves/Cable
 - Selection Harvest/Cable

Figure R-1
Record of Decision
Selected Units



Legend

- | | | | | |
|--------------------------------------|--|------------------|-----------------------|--------------------|
| LTF - Log Transfer Facility | Proposed Silvicultural Prescription
Clear Cut with Reserves/Cable | Previous Harvest | Volume Strata
High | Non-NFS Land |
| Road Number | Selection Harvest/Cable | Non-NFS Land | Medium | Water Body |
| Existing Classified Road (ML1) | | VCU Boundary | Low | Old Growth Reserve |
| Existing Classified Road (ML2) | | Project Boundary | | |
| Proposed Classified Road | | | | |
| Proposed Temporary Road | | | | |
| Proposed Classified New Construction | | | | |
| On Pre-existing Road Bed | | | | |

Figure R-2
Record of Decision
Small Sale Option

ROD Appendix 1

Non-significant Forest Plan Amendment

**Small Old-growth Habitat
Reserve Adjustments in
VCU 1180**

Non-significant Forest Plan Amendment

Small Old-growth Habitat Reserve Adjustments in VCU 1180

Based on project level analysis as described in the Old-growth Habitat Management Prescription and Appendix K of the 1997 Tongass National Forest Land and Resource Management Plan (Forest Plan), one old-growth reserve (OGR) located in VCU 1180 has been adjusted to better conform to Forest Plan Standards and Guidelines for size and location as part of the OGR strategy. Small OGRs require a contiguous landscape of at least 16 percent of the total VCU area and 50 percent of this area must be productive old-growth timber (USDA Forest Service 1997b). Along with the general criteria of size, productive old-growth timber, and connectivity, the design of each reserve should also be based on the wildlife concerns specific to the area. Criteria that are commonly used in designing small reserves include important deer winter range, probable goshawk nesting habitat, probable marbled murrelet nesting habitat, large forest blocks, rare plant associations, and landscape linkages (USDA Forest Service 1997). An interagency review by biologists from the USDA Forest Service, Alaska Department of Fish and Game (ADF&G), and U.S. Fish and Wildlife Service (USFWS) determined that the mapped small OGR in VCU 1180 did not meet the requirements for size and it did not optimize deer winter habitat. The review team recommended that the boundary be adjusted to extend further up the east side of Swanson Creek along the 800-foot contour. The adjusted boundary would be 300 feet from all classified roads to reduce disturbance and exclude all second-growth managed stands. The additional forested acreage would include high-volume old-growth stands that provide high-value deer, marten, marbled murrelet, and goshawk habitat. The modified OGR would be 2,259 acres compared to 1,469 acres identified in the Forest Plan, or 16.4 percent of the total acreage in VCU 1180. This would include 1,874 acres of low-, medium-, and high-volume old-growth timber, which is 83 percent of the acres in the OGR. Due to the amount of acres in productive old-growth non-development Land Use Designation (LUD) (e.g., semi-remote recreational) and a medium OGR in VCUs 1190 and 1200, no additional small OGRs are needed. These changes were made in consultation with USFWS and ADF&G.

The Secretary of Agriculture's implementing regulation indicates the determination of significance is to be "based on an analysis of the objectives, guidelines, and other contents of the forest plan" (36 CFR 219.10(f)). The USDA Forest Service has issued guidance for what constitutes a "significant amendment" under the National Forest Management Act. This guidance, in USDA Forest Service Handbook (FSH) 1909.12, Chapter 5.32, identifies four factors to be used in determining whether a proposed change to a Forest Plan is significant or not significant. These four factors are 1) timing; 2) location and size; 3) goals, objectives, and outputs; and 4) management prescriptions. The Alaska Region issued a Supplement to FSH 1909.12, Chapter 5.32, effective October 17, 1990, that includes an additional factor that can be considered in determining the significance of a Forest Plan Amendment. This additional factor deals with technical changes. An analysis of the factors is presented below.

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Timing

The timing factor takes into account when, during the life of the Forest Plan, the proposed change is to take place. Generally, the later the change in the life of the Forest Plan, the less likely it is to be significant.

The Forest Plan revision was completed in 1997. The Old-growth Habitat Management Prescription in the Forest Plan recognizes the small mapped reserves have received differing levels of field review and integration of site-specific information in their design. The intent of the Forest Plan was for project level environmental analysis to evaluate the size, spacing, and habitat composition of mapped reserves for project areas that include or are adjacent to mapped OGRs. Additionally, Forest Plan Appendix K gives specific instruction for how to make these changes. Clearly, modifications to the Old-growth Habitat LUD were anticipated in the Forest Plan. For these reasons, I have determined that these proposed changes relevant to timing are not considered significant.

Location and Size

This factor takes into account the location and size of the area involved in the change, and the affected area's relationship to the overall planning area. Generally, the smaller the area affected, the less likely the change is to be significant.

The area added to the small OGR was taken from the Timber Production LUD adjacent to the existing reserve. The net change in total acres for the project area is an increase of 790 acres for the Old-growth Habitat LUD, which is not considered significant with respect to the size of the overall planning area within the Tongass National Forest. This increase was needed to meet the required size for a small OGR.

Goals, Objectives, and Outputs

This factor examines whether the change alters long-term relationships between the levels of goods and services projected by the Forest Plan. In most cases, changes in outputs are not likely to be a significant change in the Forest Plan unless the change would forego the opportunity to achieve an output in later years.

Goals

The Forest Plan goal for biodiversity is to maintain healthy forest ecosystems and to maintain a mix of habitats at different spatial scales (i.e., site, watershed, island, province, and forest) capable of supporting the full range of naturally occurring flora, fauna, and ecological processes native to Southeast Alaska. The adjustment to the Couverden reserve is consistent with the goals of the Forest Plan.

Objectives

One of the objectives for the Forest Plan is to maintain a Forest-wide system of old-growth forest habitat, including reserves, non-development LUDs, and beach, estuary, and riparian corridors to sustain old-growth associated species and resources. Another objective is to ensure that the reserve system meets the minimum size, spacing, and composition criteria described in Appendix K of the Forest Plan. The adjustments to the Couverden reserve are specifically designed to meet Forest Plan objectives.

Outputs

Adjustment of this reserve will have a relatively minor effect on the Forest Plan outputs on a Forest-wide basis, primarily because the change in the acres of LUDs that allow

scheduled timber harvest is relatively small. There is a net decrease of 617 acres of forest lands classed as suitable for timber production, which is small when considered across the Tongass National Forest. Suitable forest land is defined in the National Forest Management Act by the following criteria:

- The land is forest land capable of producing 20 cubic feet per acre per year of wood volume.
- Technology is available to ensure timber production from the land without irreversible resource damage to soils productivity or watershed conditions.
- There is reasonable assurance that the land can be adequately restocked.
- The land is not withdrawn from timber production by an Act of Congress, the Secretary of Agriculture, or the Chief of the USDA Forest Service (e.g., Wilderness Areas or Resource Natural Areas).

Management Prescriptions

This factor accounts for whether the change in a management prescription is only for a specific situation or whether it would apply to future decisions throughout the planning areas. It evaluates how the change alters the desired future condition of the land and resources or the anticipated goods and services to be produced.

None of the standards and guidelines associated with the Management Prescriptions has been changed as a result of this amendment. The changes to the mapped small OGR apply only to this specific situation. These changes also would apply in future management; however, this action does not preclude future modifications being made so long as the standards and guidelines for the management prescription are achieved. The proposed amendment fulfills the desired future condition for the Old-growth Habitat LUD Management Prescription as defined in the Forest Plan and would not significantly affect the goods and services produced.

Technical Changes

Technical changes to a Forest Plan's management direction may be made on the basis of new information about the actual resource characteristics of the area. This category does not apply to this case.

Cumulative Changes

The Couverden Timber Harvest EIS is 1 of 20 National Environmental Policy Act (NEPA) decisions as of July 2004 to make non-significant amendments to the Forest Plan by modifying LUD boundaries. These changes are tracked with a monitoring question posed by the Forest Plan and are part of the Annual Monitoring and Evaluation Report.

The Niblack Environmental Assessment (EA) changed a Wild River non-development LUD to Old-growth Habitat and Timber Management LUDs. The other amendments involved enlargement or reduction of Old-growth Habitat LUDs, typically exchanging acres with one of the development LUDs in order to more effectively meet Forest Plan objectives. Usually, whenever an Old-growth Habitat LUD was expanded, there was a corresponding reduction of acres suitable for timber harvest. Likewise, an Old-growth Habitat LUD size reduction usually meant an increase in suitable acres. Often non-forest

Record of Decision

or low-productive forest lands are included in the modification of shape of a small reserve due to the natural fragmentation of forest in Southeast Alaska.

While the LUD changes within each project decision constituted non-significant Forest Plan amendments, Table A1-1 displays the accumulated effects on suitable acres for all projects. For each project, the table displays acres that were changed from a non-development LUD to a resource development LUD, or from a development LUD to Old-growth Habitat LUD. It also shows the net change in acres suitable for timber management. The net change in suitable acres represents less than 1 percent of the suitable land base.

Table A1-1.
Effects of Forest Plan Amendments on Acres Suitable for Timber Harvest as of July 2004

Project	Non-development to Development LUD Suitable Acres	Development to Non-development LUD Suitable Acres	Net Change in Suitable Acres
Couverden EIS	0	790	-790
Three Mile EIS	458	826	-368
Madan EIS	377	1,501	-1,124
Finger Mountain EIS	0	593	-593
Cholmendely EIS	894	6,873	-5,979
Woodpecker EIS	180	130	+50
Salty EA	99	126	-27
Luck Lake EIS	257	794	-537
Polk Small Sales EA	0	153	-153
Doughnut EA	0	19	-19
Kuakan EIS	416	542	-126
Sea Level EIS	185	500	-315
Canal Hoya EIS	0	151	-151
Chasina EIS	0	78	-78
Control Lake EIS	446	142	+304
Crystal Creek EIS	481	1,153	-672
Nemo Loop EA	177	932	-755
Todahl Backline EA	2	363	-361
Fire Cove Salvage EA	186	633	-447
Niblack EA	252	0	+252
Total	4,410	16,299	11,389

Conclusion

Based on a consideration of the factors above, I conclude adoption of this amendment is not significant in the context of the National Forest Management Act. This amendment is fully consistent with current Forest Plan goals and objectives. The amendment provides added detail on implementation of the Old-growth Habitat Management Prescriptions of the Forest Plan.

I hereby amend the Forest Plan with this non-significant amendment by adjusting the VCU 1180 small Old-growth Habitat Reserve as shown on Figure ROD A-1 and documented in the project planning record for the Couverden Timber Harvest Final Environmental Impact Statement.



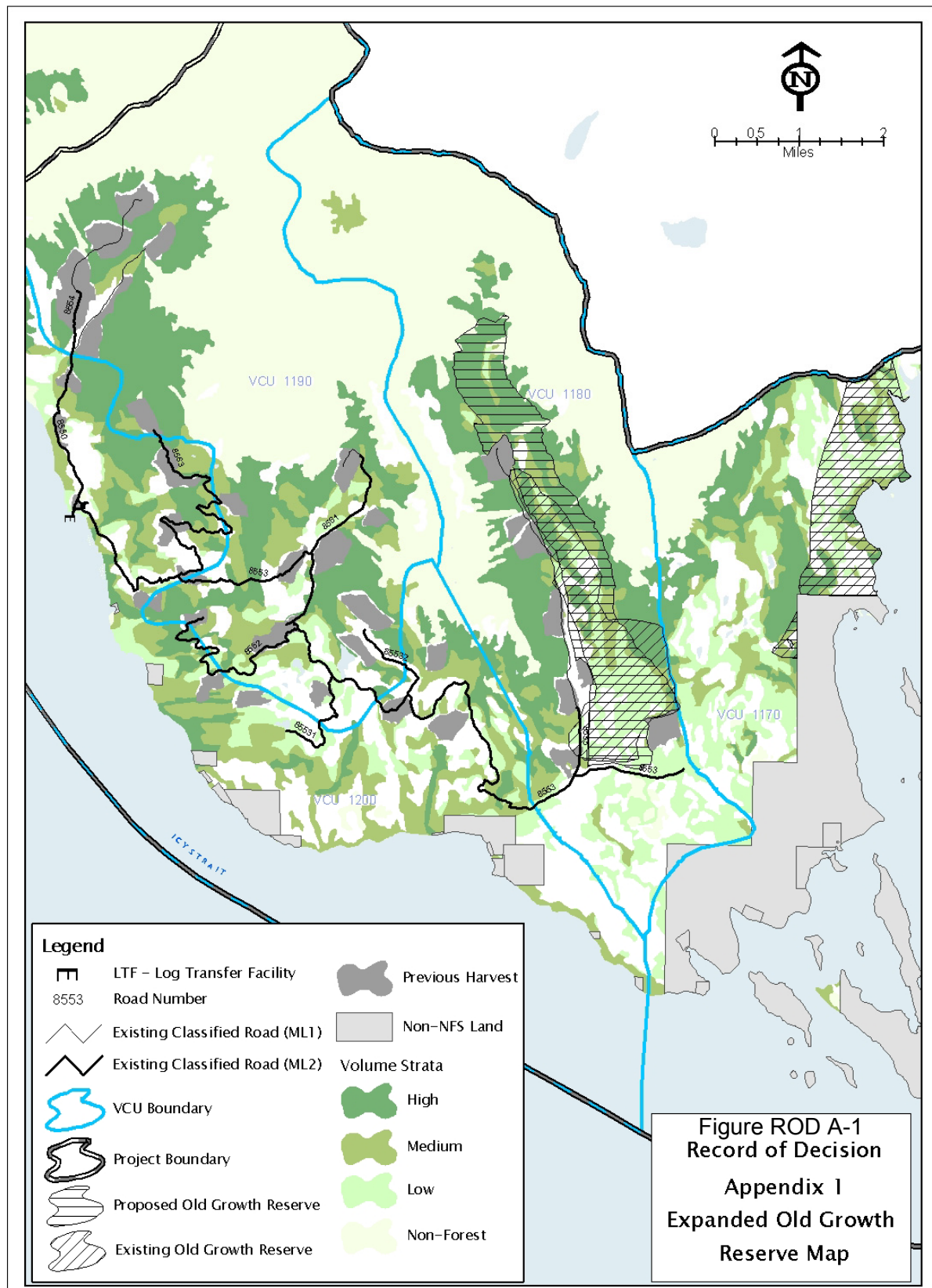
FORREST COLE

Forest Supervisor



Date

Record of Decision



ROD Appendix 2

Selected Alternative Unit and Road Cards

Unit Cards

The unit cards and road cards in Appendix 2 are used to explain site-specific information about each unit and road segment and any resource concerns and mitigation. Appendix 2 provides unit cards and maps for the proposed harvest units in the selected alternatives, in numerical order, displaying the site-specific silvicultural prescriptions, resource concerns, and mitigation for each unit. Appendix 2 also provides road cards and maps for the proposed roads in the selected alternative, including the management objectives for each segment of road. The road cards are also in numerical order.

The following section is background information for the unit and road cards. Mitigation measures incorporated into unit and road design to address resource concerns are discussed below. These mitigation measures are from the Forest Plan.

Resource Information

Silvicultural Prescriptions

Silvicultural prescriptions have been developed to meet the management objectives based on each site and the Forest Plan direction. These objectives may include retaining old-growth characteristics for biodiversity, protection of soils, watershed, wildlife habitat, or scenery values, or for designing systems that are most economical for logging feasibility on a site.

Silvicultural prescriptions will include the following unit cards, which have sale layout and marking guidelines for each unit that is included in this ROD. Minor changes to boundary layout and to the prescriptions are expected during implementation to better meet on-site conditions. The harvest treatment descriptions on the unit cards are basic guidelines to achieve the desired stand structure and logging system operability, and address resource concerns. Silvicultural systems and some of the prescriptions that may achieve the desired results are described below.

Even-age Management: Most merchantable trees would be harvested. The objective is to create a fast-growing stand of trees to maximize wood fiber production. Some trees may be left to create future stand diversity. This can generally be achieved by leaving single trees or small groups of trees near the edges of units, along the edges of yarding corridors, or in other places that do not conflict with logging feasibility or safety. Some units require retention of trees in areas that would be visible from Visual Priority Travel Routes and Use Areas. The stand would regenerate into a mostly single-aged stand. The clearcut with reserves prescription is used in the Couverden project area for even-age management.

Two-age Management: A system in which the majority of the trees in a harvest unit are cut in one entry and the rest (about 20 to 30 percent of the stand) are left as residual trees either singly or in patches. The residual trees remain unharvested to provide structural diversity and older-aged trees within the second-growth stand. The resulting stand will tend towards an uneven-age stand over time. A modified diameter limit prescription is

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used in the Couverden project area to obtain this stand structure. Trees below a unit-specific diameter (usually 16 inches dbh and smaller) and five larger trees per acre (usually over 20 inches dbh) are left. This prescription is used for uphill cable yarding with a slack-pulling cable system or shovel yarding. This prescription is used in the Couverden project area to meet Visual Quality Objectives (VQOs) and, in some places, to protect wildlife habitat.

Unit cards call for leaving snags as mitigation for wildlife. However, only snags that do not create a danger to choker setters and rigging slingers will be left standing in units.

Watersheds and Fisheries

All known streams are shown on the unit card maps. These streams and any additional streams found during layout will be protected by following the Forest Plan Riparian Standards and Guidelines listed below. Class IV streams will be protected by following Best Management Practices. Some streams were discovered during field work that were not listed in GIS. The portion of the stream in and near the proposed unit was surveyed and mapped, but not all streams were surveyed to the stream mouth; therefore, some unit card maps do not show the full stream length.

Process Groups and Channel Types

A process group describes streams with similar interrelationships between watershed runoff, landform relief, geology, and glacial or tidal influences on erosion and deposition. A channel type more precisely characterizes a stream and helps predict the probable responses to natural and human influences. Channel types incorporate other aspects such as gradient, pattern, stream bank incision and containment and riparian area vegetation communities. See the Forest Plan, Figure D-1 (page D-4), for a visual representation of the typical distribution of channel process groups. Table A2-1 shows the Forest Plan channel type codes used on the unit card narratives. Each unit card summarizes the protection. Only the channel types found in the Couverden project area are listed.

Riparian Management Areas

Stream buffers maintain biodiversity and productivity, streambank and stream channel processes and functions, the recruitment of large woody debris into the stream channel, and the beneficial uses of water quality over the short and long term. Riparian Management Areas are areas of special concern to fish, other aquatic resources, and wildlife. Riparian areas also include wetland soils and vegetation adjacent to streams. They are delineated according to the Forest Plan, Chapter 4, Riparian Standards and Guidelines (RIP2, III, E).

Riparian Standards and Guidelines for Timber Harvest

The Tongass Timber Reform Act (TTRA) mandates leaving minimum 100-foot-wide buffer strips along both sides of all Class I and Class II streams that flow into Class I streams. This was incorporated into the Forest Plan Standards and Guidelines as “No commercial harvest within 100 feet of Class I streams and Class II streams that flow into Class I streams.”

Reasonable Assurance of Windfirmness

For Floodplain (FP), Alluvial Fan (AF), High Gradient Contained (HC), Low Gradient Contained (LC), Moderate Gradient Contained (MC), Moderate Gradient/Mixed Control (MM), and Palustrine (PA) areas, manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within one site-potential tree height of the Riparian Management Area). Site-potential tree heights vary according to the process groups as follows:

Floodplain - 130 feet

Alluvial Fan - 140 feet

High Gradient Contained - 120 feet

Low Gradient Contained - 100 feet

Moderate Gradient Contained - 100 feet

Moderate Gradient/Mixed Control - 120 feet

Palustrine - 85 feet

Table A2-1
Channel Types in the Couverden Project Area

Process Group	Channel Type Code	Channel Type Description
Alluvial Fan (AF)	AF1	Moderate gradient alluvial fan channel
	AF2	High gradient alluvial cone channel
Flood Plain (FP)	FP3	Low gradient, channel width less than 10 meters
	FP4	Low gradient, channel width 10-20 meters
Low Gradient Contained (LC)	LC1*	Incision less than 10 meters
	LC2	Incision greater than 10 meters
High Gradient Contained (HC)	HC1*	Shallowly incised muskeg channel
	HC2	Shallowly to moderately incised footslope channel
	HC3	Deeply incised upper valley channel
	HC4	Deeply incised muskeg channel
	HC5	Shallowly incised high gradient channel
Moderate Gradient Contained (MC)	HC6	Deeply incised high gradient channel
	MC1	Narrow, shallow contained channel
	MC2	Moderate width and incision contained channel
Moderate Gradient, Mixed Control (MM) Palustrine (PA)	MC3*	Deeply incised contained channel
	MM1	Narrow mixed control channel
	MM2	Moderate width, mixed control channel
	PA1	Narrow, placid flow channel
	PA2*	Moderate width, placid flow channel
	PA5*	Beaver dam/pond channel

*Not identified in any of the proposed units.

Source: Forest Plan, pages D-1 - D-3.

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Visual Quality Objectives

The following VQOs from the Forest Plan provide standards for management, based on the landscape's scenic characteristics and public viewing concern.

Retention: Management activities are not visually evident.

Partial Retention: Changes in the landscape may be visually evident, but must be integrated into and visually subordinate to the surrounding landscape and should not attract attention.

Modification: Changes in the landscape may visually dominate the surrounding natural landscape; however, they should be compatible with the surrounding landscape.

Maximum Modification: Management activities may visually dominate the characteristic or surrounding landscape.

The primary scenic objective for the Scenic Viewshed LUD is to design management activities that appear natural when viewed from Visual Priority Travel Routes and Use Areas. In the Timber Production LUD, management activities may clearly dominate the natural landscape character, but still mimic some visual features of the surrounding landscape while allowing a sustained yield of timber.

Table A2-2 lists the VQOs for project area. Table A2-3 lists the VQO for each unit selected for harvest.

Table A2-2
VQOs for the Scenic Viewshed and Timber Management LUDs

Distance Zone	Scenic Viewshed	Timber Management
Visible from Visual Priority Travel Routes and Use Areas:		
Foreground (0 to 1/2 miles)	Retention	Modification
Middleground (1/2 - 3 to 5 miles)	Partial Retention	Maximum Modification
Background (3 to 5 miles and greater)	Partial Retention	Maximum Modification
Not Visible from Visual Priority Travel Routes and Use Areas:		
Not Seen	Maximum Modification	Maximum Modification

Table A2-3
VQOs for Units Under the Selected Alternative by LUD

Scenic Viewshed/ Partial Retention	Timber Production/ Maximum Modification
HS5	HS10
HS7	H11
H12 ^a	H12 ^a
H14	H18
H15	H19
H16	H24
H17	H25
S40	H26
S42	H29

^a - Part of the unit has this LUD and VQO

Site-Specific Mitigation Measures Incorporated Into Unit and Road Design

The site-specific mitigation measures that are applied to selected unit and/or roads are identified in this section. Listed below is a summary of the Forest Plan Mitigation Measures. The source(s) of each general measure are listed after the measure in terms of individual Forest Plan Standards and Guidelines (see Chapter 4 of the Forest Plan) or BMPs (see Appendix C of the Forest Plan and Chapter 10 of FSH 2509.22, Region Soil and Water Conservation Handbook).

Fish, Water, and Soils

F1 Riparian Buffers: Establish no-harvest and selective cut buffers along streams and around lakes to protect riparian areas as defined by the Riparian Standards and Guidelines. Protect buffers from adjacent harvest activities (e.g., directional felling, split yarding, and suspension requirements) (RIP2, BMP 12.6).

F2 Directional Felling along Buffers: Trees identified for harvest will be felled to avoid riparian areas designated for “no commercial harvest” and stream courses (RIP2-II).

F3 Class III/IV Stream Protection: Split yard and directionally fall trees away from Class IV streams without buffers (RIP2-II).

F8 Siting of Road-Stream Crossings: Modify the location of road-stream crossings to correspond with stable stream reaches (TRAN214-II).

F9 Routing of Roads near Streams: Modify road routes to avoid locations near fish-bearing streams (TRAN214-II).

F10 Routing of Roads through Wetlands and Other Sensitive Areas: Modify location of Forest Development Roads to minimize impact to wetlands, floodplains, estuaries, and tidal meadows (TRAN214-III).

F11 Harvesting Timber in/near Wetlands and Floodplains: Modify unit design or logging system to avoid or minimize damage to muskegs, other wetlands, or floodplains (S&W112-I, BMP 12.4 and 12.5).

F14 Avoid Harvesting High Hazard Soils: Modify unit design to avoid very high mass movement areas, including slopes greater than 72 percent (S&W112-I, BMP 13.5).

F15 Avoid Road Development on Very High Hazard Soils: Avoid road construction along unstable slopes, including slopes greater than 67 percent (S&W112-I and BMP 13.5).

Timber

T1 Maintain Advanced Regeneration: Maintain advanced regeneration within the units to meet reforestation needs and stand objectives (TIM111-2-I).

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Wildlife and Threatened/Endangered/Sensitive Species

W1 Provide Habitat Diversity by Using the Clearcutting with Reserves

System: Provide for greater habitat diversity on a stand level over time by using clearcutting with reserve trees (even-aged system) as a harvest prescription (see Appendix G to Forest Plan FEIS) (WILD112 - III).

W6 Provide Habitat Diversity by Using the Uneven-age Harvest System:

Provide for greater habitat diversity on a stand level over time by using the selection method (uneven-age system) as a harvest prescription (see Appendix G to Forest Plan FEIS) (WILD112 - III).

W7 Leaving Non-merchantable Trees and Snags: Provide for greater habitat diversity on a stand level over time by leaving most non-merchantable trees and snags after harvest (WILD112 - III). Only snags that do not create a danger to choker setters and rigging slingers will be left standing in units.

W9 Road Closures: Close roads to motorized use to protect wolves and other species from over harvest (WILD112).

W13 Protection of Bald Eagle Nest Trees/Other Sites and Timing of

Activities: Avoid all activity, modify unit or road design, and/or limit timing of activities near bald eagle nest trees, perch trees, and winter roost sites in accordance with the Interagency Agreement established with the USFWS (WILD112-V).

W23 Buffers along Brown Bear Streams: Establish forested buffers, where available, of approximately 500 feet along streams, where additional protective measures are needed to provide cover for brown bears while feeding (WILD112-VI).

Recreation and Tourism

R1 Access Restrictions for Recreation: Close or restrict access on roads to maintain remoteness of areas after harvest (REC112-II).

Scenery

V1 Meet Visual Resource Objectives by Using the Clearcutting with

Reserves System: Reduce visual contrast with adjacent areas by using clearcutting with reserve trees (even-aged system) as a harvest prescription (see Appendix G to Forest Plan FEIS) (VIS11 - III).

V5 Patch/Strip Clearcutting: Reduce visual contrast with adjacent areas by using patch or strip clearcutting (two-age or uneven-age systems) as a harvest prescription (see Appendix G to Forest Plan FEIS) (VIS11-III).

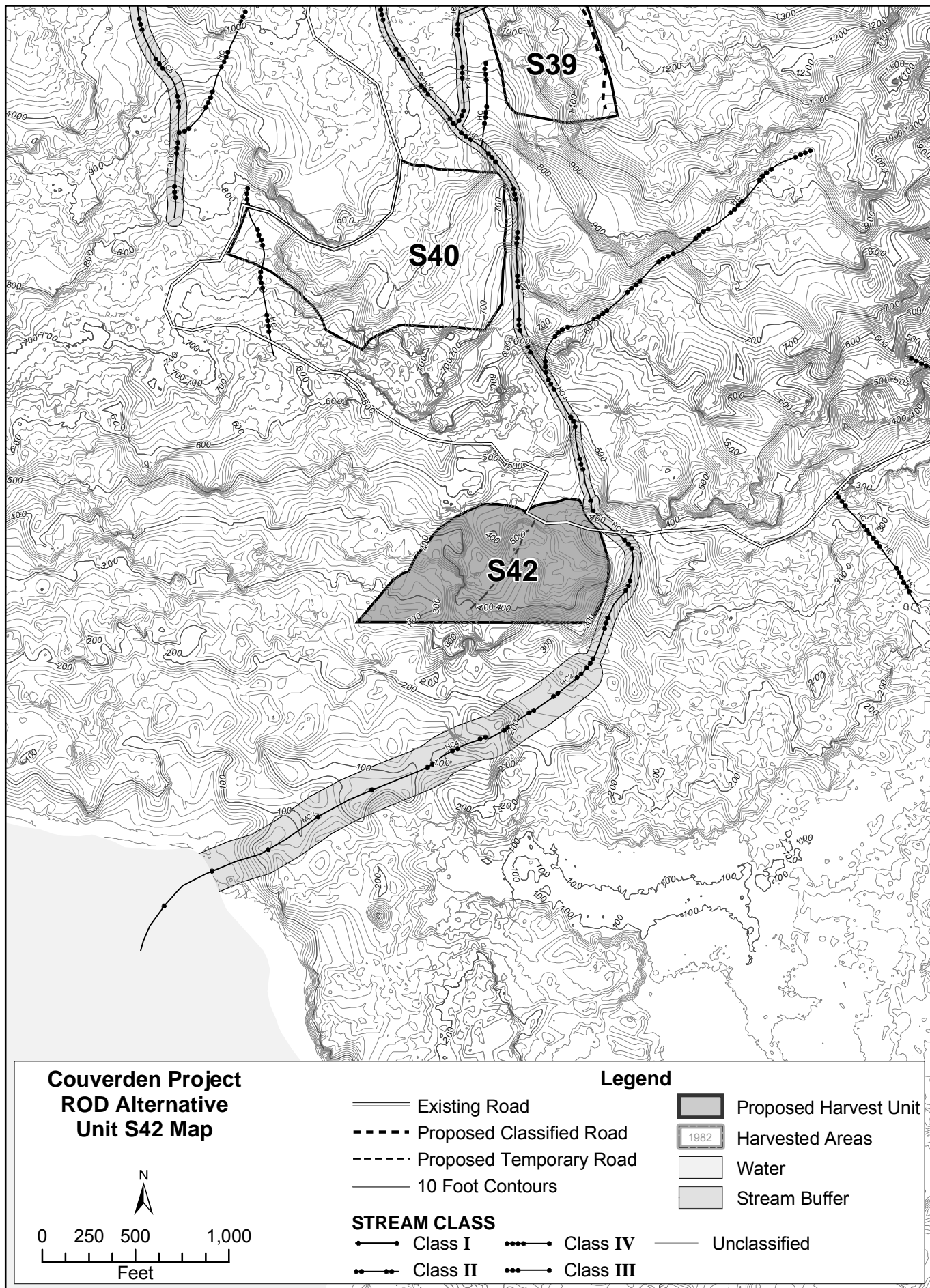
V6 Meet Visual Resource Objectives by Using the Uneven-age Harvest

System: Reduce visual contrast with adjacent areas by using the selection method (uneven-age system) as a harvest prescription (see Appendix G to Forest Plan FEIS) (VIS11 - III).

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V7 Leaving Non-merchantable Trees: Reduce visual contrast with adjacent areas by leaving most non-merchantable trees after harvest (VIS11 - III).

V8 Modification of Unit Boundaries: Modify unit boundaries to ensure that the harvest unit meets the proposed VQO in partial retention and retention areas (VIS11-II).



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COUVERDEN TIMBER SALE(S) - UNIT CARD Unit No. HS5 ROD Alternative

Harvest Method: Short Skyline (cable)

Total Acres: 46

Total Volume: 1,664 MBF

Volume per Acre: 46 MBF

UNIT DEVELOPMENT

Unit designed to meet VQO of partial retention. Unit boundaries are based on Alternative 3; however, boundaries were extended to include unroaded and SEIS roadless areas but do not include Inventoried Roadless Areas covered by the Roadless Rule. The following mitigation measures were either taken into account during unit design, or they will be applied during project implementation: F1, F2, F3, F14, T1, W6, W7, W23, V5, V6, and V7.

Logging and Transportation: The timber can be yarded using a short skyline system. There are three settings within the unit. Setting A: both uphill and downhill yarding to landing 1 on Road 8550150. Tail trees are required, including tail holds in Class III stream buffer to the north. Setting B: uphill/downhill yarding to continuous landing on segments of Road 8550150. Tail trees are required. Setting C: short skyline on existing roads. Tail trees are required, including some tail holds in the stream buffer. Class III stream, V-notch along the western boundary will require directional felling away from slope break buffer (BMP 12.6(A), 13.16). The V-notch stream on north boundary abuts an old clearcut, windthrow area in the upper part of unit. The buffer on V-notch may be prone to windthrow, especially the upper end. The upper part of the unit is visible from saltwater.

Classified Roads: The unit will be accessed from the road, which begins from the end of existing logging spur. Existing road requires extensive brushing, placement of culverts, and re-rocking. Approximately 0.47 mile of new classified road will be needed to access the unit. Road continues on to access HS7 and future units. Except for 0.8 mile of the 8550 road, existing roads will remain open and will be available for OHV use. New roads constructed for this project will be placed in a storage condition after use. Roads in storage are not considered usable by normal vehicle traffic.

Temporary Roads: No temporary roads will be needed.

Stand Management Objectives: The future stand will be two-aged, tending towards uneven-age over time with a mix of large- and medium-size trees and seedlings and saplings.

Treatment: Single tree selection and group selection. Wildlife buffer will be left between the Homeshore Creek and Road 8550 (west half of Setting C). See the Wildlife section. The area below the proposed road will be managed using diameter cuts, and the area above the proposed road will be managed with group selection cuts. Diameter cut will consist leaving all trees 25" DBH and smaller, plus 5 trees per acre larger than 25" DBH. Retention trees should be selected based on windfirmness and should be distributed as to minimize visual impacts. To provide protection for the Class III V-notch on the north end of the unit, a 50- to 100-foot feathered windfirm buffer should be left along the entire length of the unit/setting boundaries. The group selection cuts will consist of logging 2-acre areas above the proposed road, harvesting approximately half of this area. There will be no harvest on the 72% slope ground near the northeast corner of the unit.

Regeneration Method: T1. Natural regeneration. The stand is likely to be a mixture of species similar to the existing stand.

Possible Future Treatments: Possible planting if natural regeneration does not result in fully stocked stand or to increase species diversity. No release or pre-commercial thinning is planned. Future single tree selection and group selections every 50 to 60 years. Future entries will maintain a minimum of 20% retention trees.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: The unit is bordered to the north by one small Class III/IV stream, which has a moderate size V-notch portion near the upper half of the unit (Class III) before entering the less incised lower portion of the (Class IV) channel. This stream becomes a roadside ditch for more than 500 feet before passing through a pond area and becoming a Class I stream tributary to Homeshore Creek.

Mitigation: F1. The upper Class III portion of the stream should have no programmed harvest within V-notch or side slope break of Class III channel. Manage the area beyond (approximately one site-potential tree height) for reasonable assurance of windfirmness. F2, F3. The lower part of the stream may require directional felling, splitline, partial, or full suspension for Class IV portion of this channel.

Record of Decision

Soils/Wetlands/Karst

Concern: There are three landslides within 0.5 mile of the unit. One of the landslides is located in a Class III V-notch on the north side of the unit. There are two patches of >72% slopes near northeast corner and 3 acres of >55% slopes in central portion of unit.

Mitigation: F1. Maintain stream and windfirm buffer (BMP 12.6(a), 13.16) to protect Class III V-notch stream. F14. Avoid harvest on slopes >72% and unstable slopes (BMP 13.5). Keep the unit boundary below 72% + slope area east of the unit.

Wildlife

Concern: Unit contains high-volume, high-structure habitat for deer and marten and is adjacent to critical brown bear foraging buffer. There are documented travel corridors throughout this unit. The unit is adjacent to an important brown bear feeding stream.

Mitigation: W6, W7. Use uneven-age management and leave non-merchantable trees and snags to provide habitat diversity over time. Seasonal restrictions may apply during brown bear foraging activities. W23. Maintain a 500-foot buffer along Homeshore Creek to provide cover for brown bears.

Visual/Recreation

Concern: Meet VQO of partial retention. Approximately 27 acres of the harvested unit is visible from Homeshore Bay and Icy Strait (KVAs 2 and 4, respectively).

Mitigation: V5. Leave unharvested strips above road to reduce visual contrast above temporary road. V6. Leave trees 25" DBH and smaller, plus 5 trees per acre larger than 25" DBH in remainder of unit. Leave trees below the road to screen it from KVAs. V7. Leave most non-merchantable trees to help reduce visual contrast.

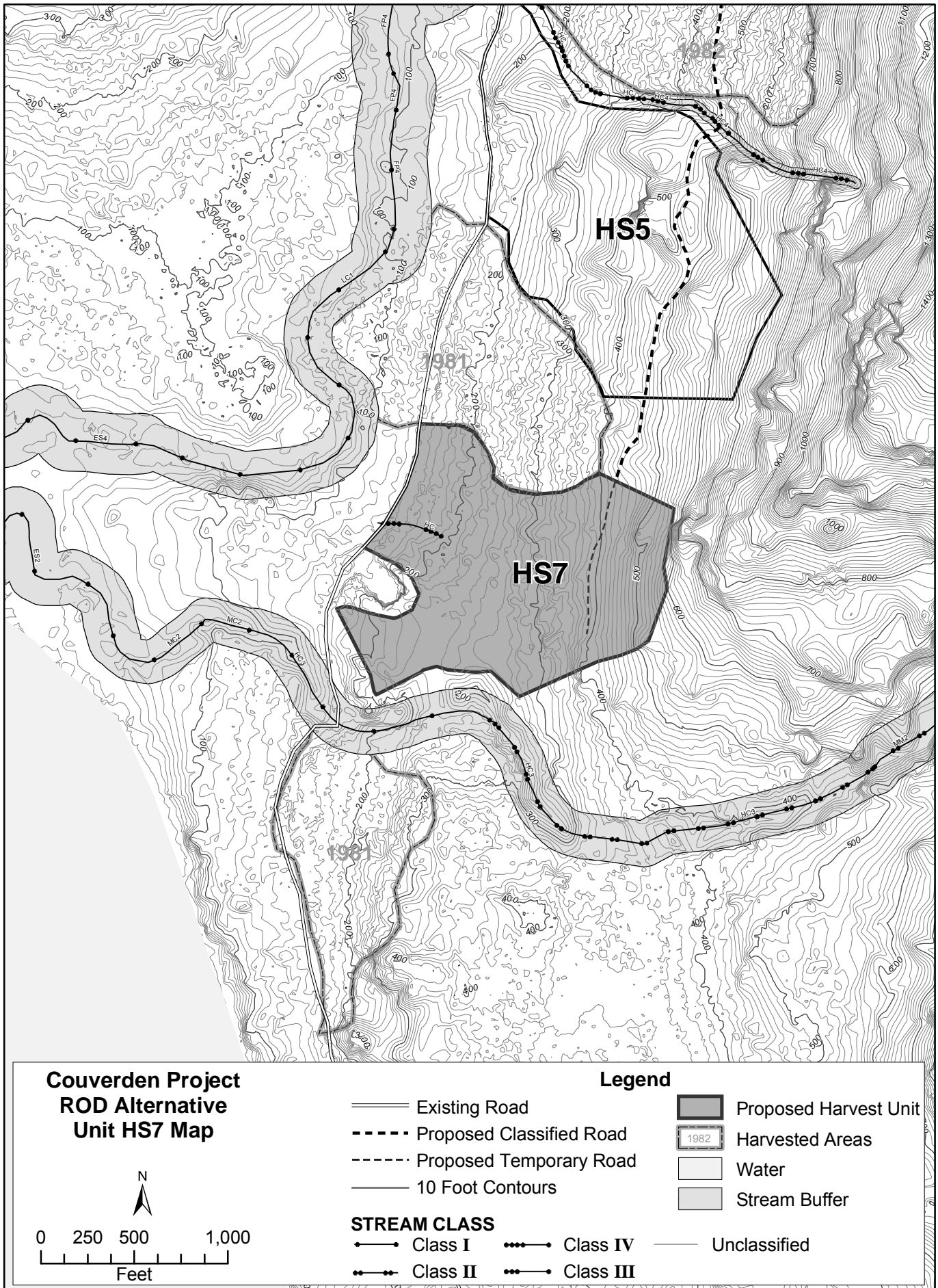
Other Resources/Issues

Concern: None

Mitigation:

Record of Decision

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Record of Decision

COUVERDEN TIMBER SALE(S) - UNIT CARD Unit No. HS7

ROD Alternative

Harvest Method: Short Skyline (cable)

Total Acres: 37

Total Volume: 623 MBF

Volume per Acre: 21 MBF

UNIT DEVELOPMENT

Unit designed to meet VQO of partial retention. Unit boundaries are based on Alternative 3; however, boundaries were extended to include unroaded and SEIS roadless areas but do not include Inventoried Roadless Areas covered by the Roadless Rule. The following mitigation measures were either taken into account during unit design, or they will be applied during project implementation: F1, F2, F3, F14, T1, W6, W7, W23, V5, V6, and V7.

Logging and Transportation: The timber can be yarded with a short skyline system using the temporary road as a continuous roadside landing. There are two settings in the unit: Settings A and B. Setting A: short skyline to continuous landing on temporary road. Tail trees are required with some tail holds within the stream buffer. Setting B short skyline to continuous landing on Road 8550. Guylines will be anchored out of the unit in a stream buffer in southwest corner of unit. Windthrow is not expected to be a problem after harvest. Class III stream along the southern boundary will require directional felling away from slope break buffer (BMP 12.6(a), 13.16). Obtain partial suspension over Class IV streams within unit. Upper half of unit is visible from saltwater.

Classified Roads: Approximately 0.13 mile of new classified road will be needed to access the unit. It will be a continuation of the road built through HS5. Except for 0.8 mile of the 8550 road, existing roads will remain open and will be available for OHV use. New roads constructed for this project will be placed in a storage condition after use. Roads in storage are not considered usable by normal vehicle traffic.

Temporary Roads: Approximately 0.16 mile of temporary road will be needed at the upper end of unit. The temporary road will be obliterated after use.

Stand Management Objectives: The future stand will be two-aged, tending towards uneven-age over time with a mix of large- and medium-size trees and seedlings and saplings.

Treatment: Single tree selection and group selection. Area below the new road will be diameter cut and the area above will be group selection. Diameter cut will leave all trees 16" DBH and smaller, plus 5 trees per acre 20" DBH or larger. Retention trees should be distributed to minimize visual impacts. The group selection will consist of logging 2-acre areas above the road, harvesting about half the area above the road.

Regeneration Method: T1. Natural regeneration. The stand is likely to be a mixture of species similar to the existing stand.

Possible Future Treatments: Possible planting if natural regeneration does not result in fully stocked stand or to increase species diversity; no release or pre-commercial thinning expected. Future entries will maintain a minimum of 10% by volume of the stand in mature trees and 20% retention trees. Plan a similar entry every 50 to 60 years.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: The unit is bounded to the south by a medium-sized Class I stream. The streambank is moderately steep and disturbance on the slope may be a concern for sediment delivery to the stream. One short Class IV stream is present near the existing main road (8550) in the lower west portion of the unit.

Mitigation: F1. No commercial harvest within 100 feet of the Class I stream channel to the south or the top of V-notch, whichever is greater. Manage the area beyond (approximately one site-potential tree height, about 120 feet) for reasonable assurance of windfirmness. F2, F3. The short midunit Class IV stream may require directional felling, splitline, partial, or full suspension for the Class IV channel within the lower portion of this unit.

Soils/Wetlands/Karst

Concern: There are two landslides within 0.5 mile of unit. Class I stream south of unit.

Mitigation: F14. Avoid harvest on unstable slopes (BMP 13.5). Keep unit boundary below 72%+ slope area east of the unit.

Wildlife

Concern: Unit contains high-volume, high-structure habitat for deer and marten habitat and is adjacent to critical brown bear foraging buffer. There are documented travel corridors throughout the unit.

Record of Decision

Mitigation: W6, W7. Use uneven-age management and retain non-merchantable trees and snags to provide habitat diversity over time. Seasonal restrictions may apply during brown bear foraging activities. W23. Maintain a 500-foot buffer along Homeshore Creek to provide cover for brown bears.

Visual/Recreation

Concern: Meet the partial retention VQO. Approximately 18 acres of the harvested unit would be visible from Homeshore Bay and Icy Strait (KVAs 2 and 4, respectively).

Mitigation: V5. Leave unharvested strips above road to reduce visual contrast above temporary road. V6. Leave trees 16” DBH and smaller, plus 5 trees per acre at least 20” DBH in remainder of unit. Leave trees below the road to screen it from KVAs. V7. Leave most non-merchantable trees to help reduce visual contrast.

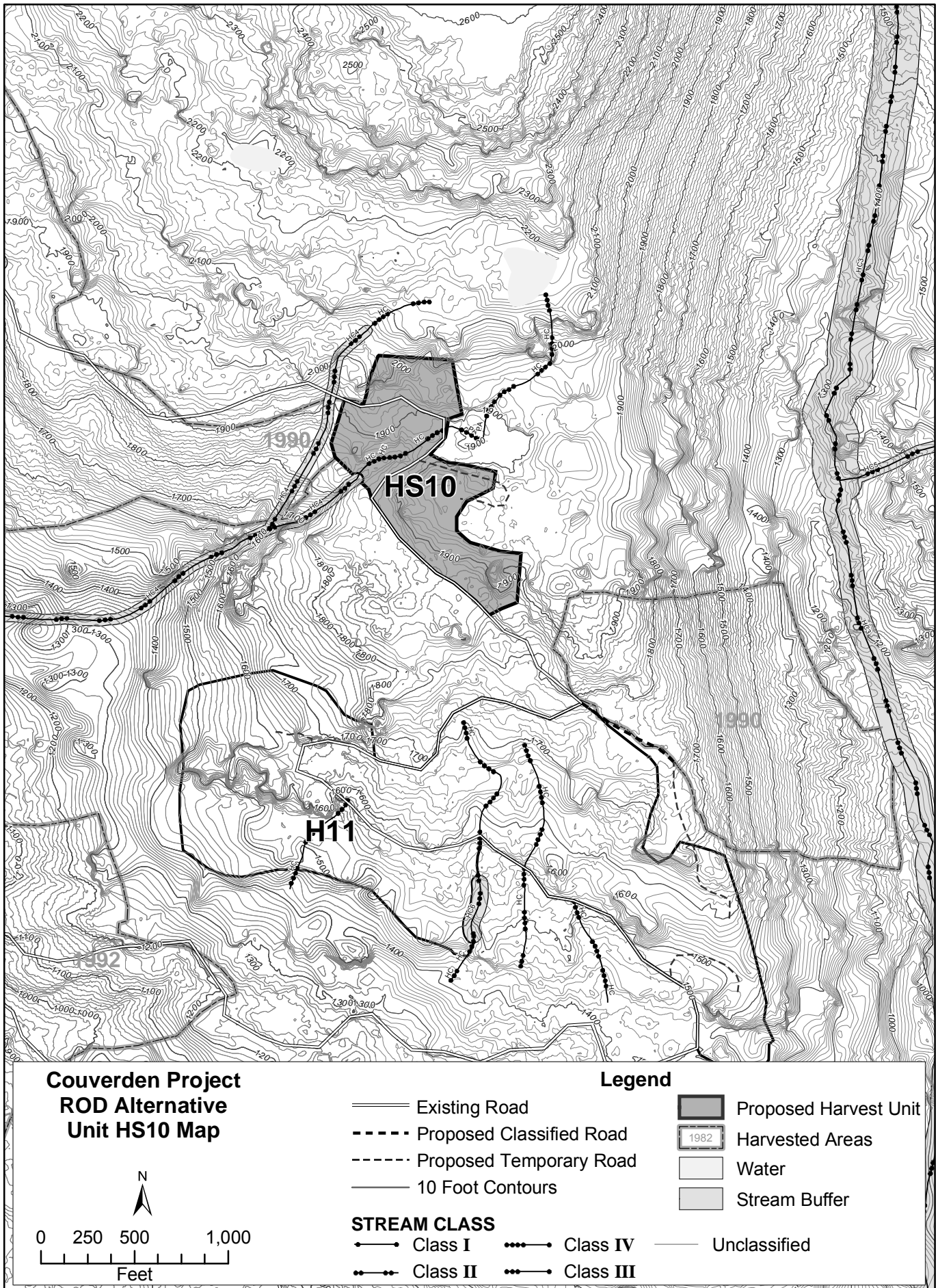
Other Resources/Issues

Concern: None

Mitigation:

Record of Decision

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COUVERDEN TIMBER SALE(S) - UNIT CARD Unit No. HS10

ROD Alternative

Harvest Method: Shovel & Short Skyline

Total Acres: 15

Total Volume: 530 MBF

Volume per Acre: 39 MBF

UNIT DEVELOPMENT

Unit designed to meet VQO of maximum modification. Unit boundaries are based on Alternative 3. The following mitigation measures were either taken into account during unit design, or they will be applied during project implementation: F1, F2, F3, F10, F11, T1, W1, W7, V1, and V7.

Logging and Transportation: The timber can be yarded with a shovel and a short skyline system using the existing road and proposed temporary road as a continuous roadside landing. A small portion of the unit along the eastern boundary will be shovel ground. Majority of the unit is a skyline system with short yarding distances. There is one Class IV stream in the unit. This stream turns into a Class III stream at the west end of the unit and will require buffering (BMP 12.6(a), 13.16). Partial suspension can be achieved when necessary to yard over stream. Blowdown was found; windthrow may be a concern in the southwest corner of the unit after harvest. Portions of this unit will be visible from saltwater.

Classified Roads: No new classified road will be needed to access the unit. Except for 0.8 mile of the 8550 road, existing roads will remain open and would be available for OHV use.

Temporary Roads: Approximately 0.58 mile of temporary road will be needed. The temporary road will be obliterated after use.

Stand Management Objectives: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Treatment: Clearcut with reserve trees. Leave reserve tree patches along western boundary north of stream to provide windfirm buffer. The eastern half of the unit was dropped because it has poor timber and provides a travel corridor for wildlife to the alpine. In addition, it is cost prohibitive to access the east half of the unit given the low value of the timber available. This prescription would optimize the regeneration potential for fiber production (especially for spruce), reduce mistletoe, and would be the most economical harvest method. The prescription is also appropriate to meet wildlife, watershed, and other resource objectives. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old-growth trees in original harvest, plus enough large second-growth trees to meet the 10% reserve requirement.

Regeneration Method: T1. Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

Possible Future Treatments: Possible planting if natural regeneration does not result in fully stocked stand or to increase species diversity, release, and pre-commercial thinning. Similar harvest in approximately 100 years.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: One Class IV stream (draining a small pond) passes through the middle of the unit. It changes to a Class III channel at the unit boundary. The Class III portion could be affected by harvest. Another stream is near the unit boundary to the northwest containing Class III and IV channels. A small portion of this channel could be influenced by harvest practices. Based on electrofishing downstream, this unit is over 5,000 feet upstream of fish habitat.

Mitigation: F1. No programmed harvest within V-notch or side slope break of Class III channel. Manage the area beyond (approximately one site-potential tree height about 120 feet) for reasonable assurance of windfirmness. F2, F3. The Class IV stream that traverses the unit center may require directional felling, splitline, partial, or full suspension within the unit.

Soils/Wetlands/Karst

Concern: There is a wetland east of the unit.

Mitigation: F10. Modify temporary road location to minimize impacts to wetlands. F11. Modify logging system to avoid or minimize damage to wetland.

Wildlife

Concern: This unit is designed as a clearcut.

Mitigation: W1, W7. Use clearcut with reserves system and retain non-merchantable trees and snags to maintain habitat diversity.

Record of Decision

Visual/Recreation

Concern: Meet the maximum modification VQO. Approximately 2 acres in the northwest of the harvested unit would be visible as background from Icy Strait (KVAs 4).

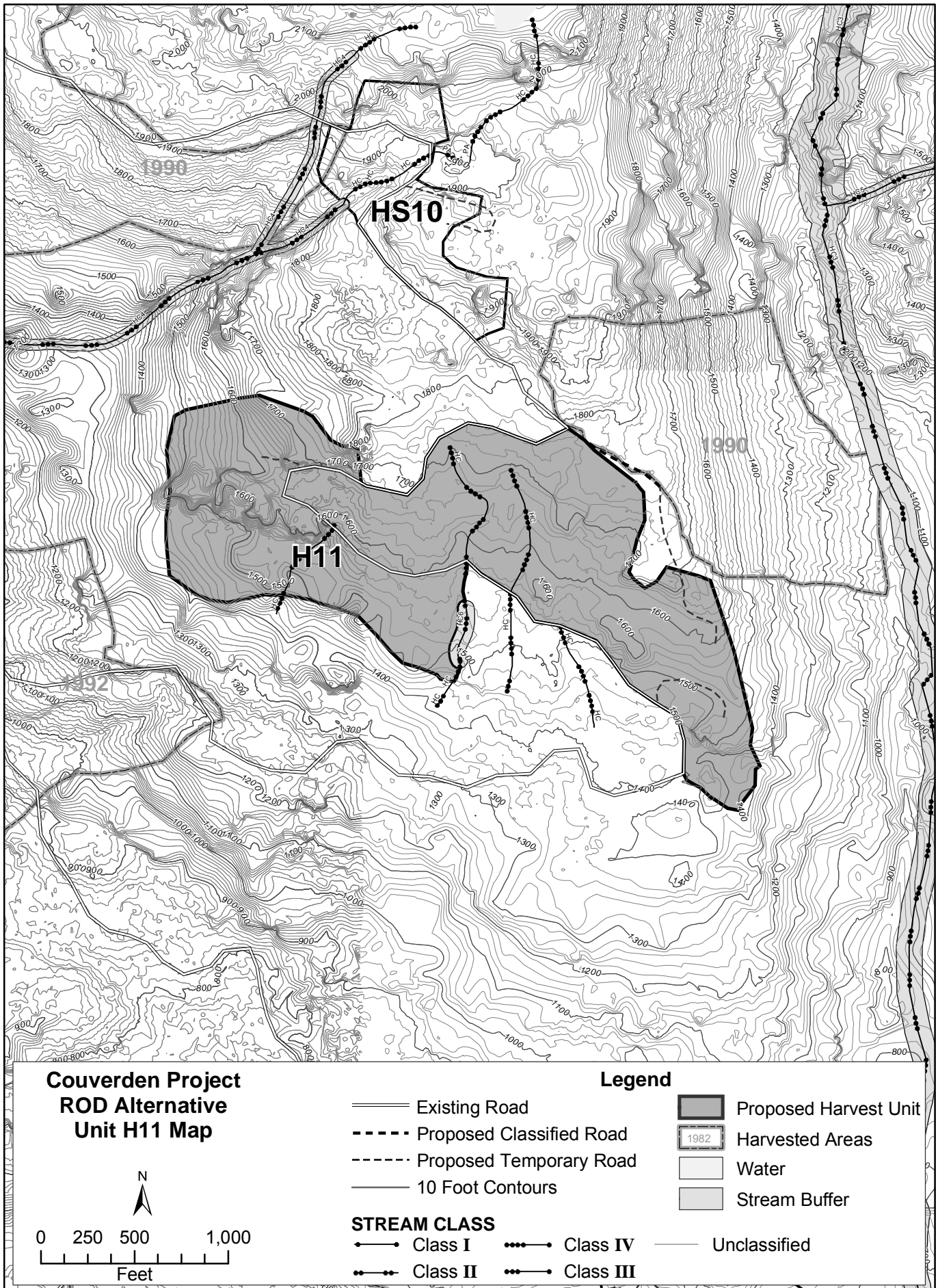
Mitigation: V1. Reserve trees would be concentrated in visible areas and steep areas to reduce visual contrast. V7. Leave most non-merchantable trees to help reduce visual contrast.

Other Resources/Issues

Concern: None

Mitigation:

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COUVERDEN TIMBER SALE(S) - UNIT CARD Unit No. H11

ROD Alternative

Harvest Method: Short Skyline (cable)

Total Acres: 68

Total Volume: 2,059 MBF

Volume per Acre: 33MBF

UNIT DEVELOPMENT

Unit designed to meet VQO of maximum modification. Unit boundaries are based on Alternative 3. The following mitigation measures were either taken into account during unit design, or they will be applied during project implementation: F1, F2, F3, F14, T1, W1, W7, V1, and V7.

Logging and Transportation: The unit can be yarded with a short skyline system using the existing road as a continuous roadside landing. There are poor guyline anchors behind the landing on the east side of the unit. Deadmen anchors or equipment anchors may be used. The unit has one Class III stream that borders the southeast central boundary that will require buffering and protection (BMP 12.6(a), 13.16). There are several Class IV streams throughout the unit. These streams can be split yarded. Blowdown was found; windthrow may be a problem in the northeast portion of the unit after harvest. The unit is visible from saltwater.

Classified Roads: No new classified roads will be needed to access the unit. Except for 0.8 mile of the 8550 road, existing roads will remain open and would be available for OHV use.

Temporary Roads: Three temporary roads will be needed to access portions of the unit not loggable to the existing road. The northwest road is approximately 0.06 mile; a 0.10-mile road will access the southeast corner; and the northeast road is approximately 0.13 mile. The temporary roads will be obliterated after use.

Stand Management Objectives: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Treatment: Clearcut with reserves. Reserve trees, snags, and non-merchantable trees should be left along the north cutting boundary in windfirm patches. This prescription would optimize the regeneration potential for fiber production (especially for spruce), reduce mistletoe, and would be the most economical harvest method. The prescription is appropriate to meet wildlife, watershed, and other resource objectives.

Regeneration Method: T1. Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

Possible Future Treatments: Possible planting if natural regeneration does not result in fully stocked stand or to increase species diversity, release, and pre-commercial thinning. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old-growth trees in original harvest, plus enough large second-growth trees to meet the 10% reserve requirement.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: Four streams and several nonstreams drain this large unit. A Class III segment is present in the south-central portion of the unit. This segment forms part of the central unit boundary and enters a Class IV reach before exiting the unit. There are four Class IV reaches in the unit; all drain the central half of the unit. Blowdown is apparent in the central unit area north of the lower road. No fish habitat is near these streams.

Mitigation: F1. The Class III segment along the south-central unit boundary should have no programmed harvest within V-notch or side slope breaks of the channel. Manage the area beyond (approximately one site-potential tree height, about 120 feet) for reasonable assurance of windfirmness. F2, F3. The Class IV segments within the unit may require directional felling, splitline, partial, or full suspension for Class IV channels.

Soils/Wetlands/Karst

Concern: One landslide within 0.5 mile of unit; 0.3-acre patch of >72% slopes north of the road.

Mitigation: F14. Avoid harvest on slopes >72% and unstable slopes (BMP 13.5).

Wildlife/TES Plants

Concern: This unit is designed as a clearcut.

Record of Decision

Mitigation: W1, W7. Use clearcut with reserves system and retain non-merchantable trees and snags to maintain habitat diversity.

Visual/Recreation

Concern: Meet the maximum modification VQO. Approximately 33 acres of the harvested unit would be visible from surrounding KVAs, including Icy Strait (KVA 4), the LTF (KVA 3), and Homeshore Bay (KVA 2).

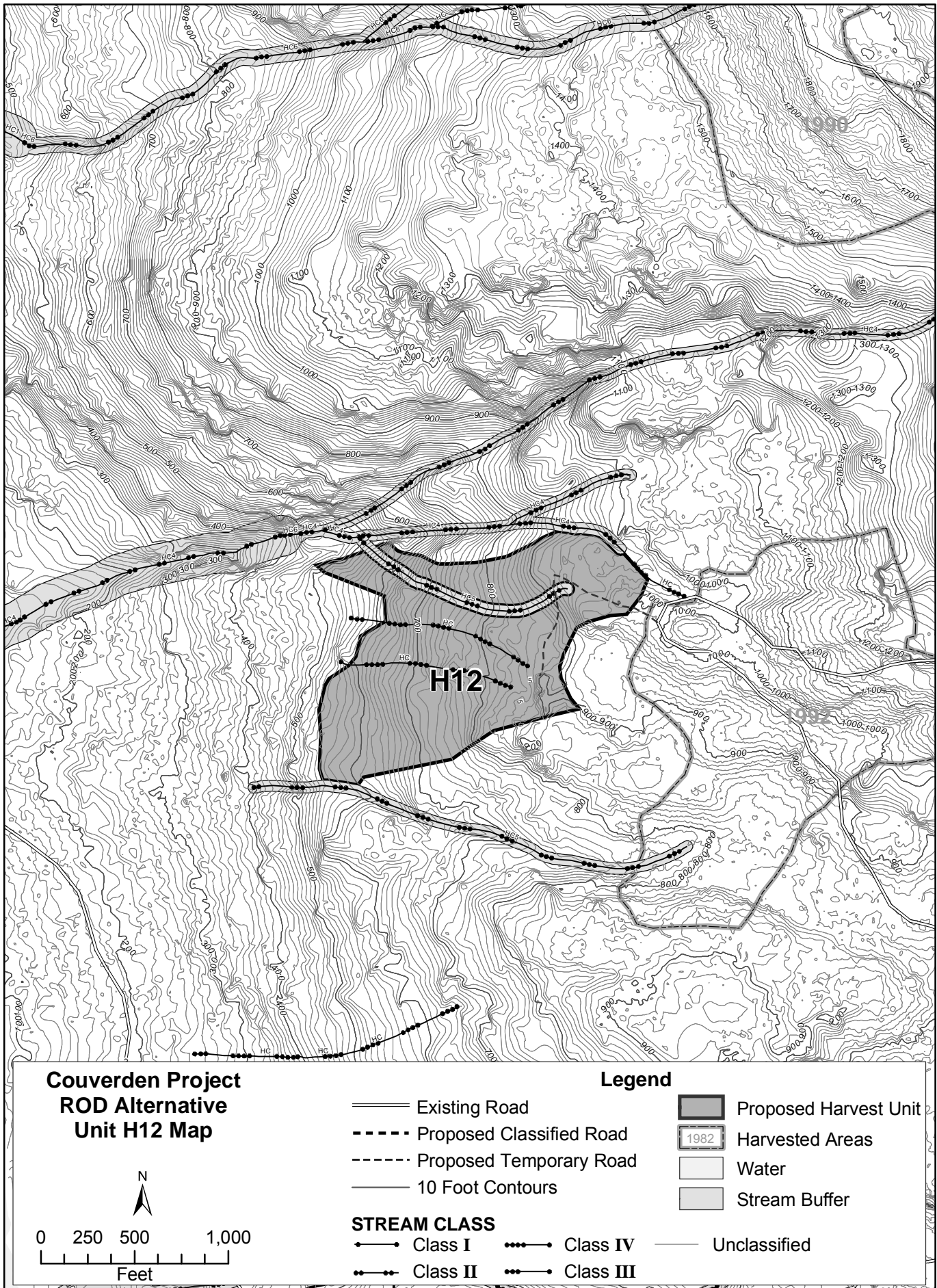
Mitigation: V1. Reserve trees would be concentrated in visible areas and steep areas to reduce visual contrast. V7. Leave most non-merchantable trees to help reduce visual contrast.

Other Resources/Issues

Concern: None

Mitigation:

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COUVERDEN TIMBER SALE(S) - UNIT CARD Unit No. H12 ROD Alternative

Harvest Method: Short Skyline

Total Acres: 31

Total Volume: 811 MBF

Volume per Acre: 33 MBF

UNIT DEVELOPMENT

Unit designed to meet VQO of partial retention. Unit boundaries are based on Alternative 3; however, boundaries were extended to include unroaded and SEIS roadless areas but do not include Inventoried Roadless Areas covered by the Roadless Rule. The following mitigation measures were either taken into account during unit design, or they will be applied during project implementation: F1, F2, F3, F14, T1, W6, W7, V5, V6, and V7. These measures are described below within the resources section that apply.

Logging and Transportation: The timber can be yarded using a short skyline system. Class III streams along the northern boundary and inside the unit will require directional felling away from slope break buffer. (BMP 12.6(a), 13.16). The logging systems are set up for split yarding all Class III and IV streams. There is no evidence of windthrow problems, but the unit is very exposed to the west and southwest winds. Majority of the unit is visible from saltwater. See Visual/Recreation section.

Classified Roads: No new classified roads will be needed to access the unit. Except for 0.8 mile of the 8550 road, existing roads will remain open and would be available for OHV use.

Temporary Roads: Approximately 0.3 mile of temporary road construction will be needed to access the unit. The temporary road will be obliterated after use.

Stand Management Objectives: The future stand will be two-aged, tending towards uneven-age over time with a mix of large- and medium-size trees and seedlings and saplings.

Treatment: Single tree selection and group selection. Diameter cut on sloped areas facing the saltwater and group selection on the benches. Diameter cut will consist of leaving all trees 16" DBH and smaller, plus 5 trees per acre at least 20" DBH. Retention trees should be selected based on windfirmness and should be distributed as to minimize visual impacts. The patch cut will consist of logging 2-acre areas on the benches, harvesting about half the area. Group selection on the benches would allow for spruce regeneration while meeting the VQO requirements.

Regeneration Method: T1. Natural regeneration. The majority of the stand is hemlock.

Possible Future Treatments: Possible planting if natural regeneration does not result in fully stocked stand or to increase species diversity, release, and pre-commercial thinning may be necessary in patch cuts. Similar harvests every 50 to 60 years. Future entries will maintain a minimum of 10% by volume of the stand in mature trees and 20% retention trees.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: Two Class III streams are present in the west-central unit area, one on the border and one within the unit. The unit also includes two Class IV segments, one within and one bordering the unit in the northeast. The unit is about 200 feet upstream of a falls that is barrier to Class II (non-direct) fish habitat, about 400 feet below the unit. Electrofishing downstream of this site confirmed the presence of Dolly Varden. The Class III to the north is a large V-notch high gradient stream with steep banks. Care will be needed to ensure this bank remains undisturbed to prevent water quality problems downstream in resident fish habitat.

Mitigation: F1. The Class III channel should have no programmed harvest within V-notch or side slope breaks. Manage the area beyond (approximately one site-potential tree height, about 120 feet) for reasonable assurance of windfirmness. F2, F3. The two Class IV channels within the unit may require directional felling, splitline, partial, or full suspension for the channels present.

Soils/Wetlands/Karst

Concern: One landslide within 0.5 mile of unit.

Mitigation: F14. Avoid harvest on slopes >72% and unstable slopes (BMP 13.5).

Record of Decision

Wildlife

Concern: The west half of unit contains medium deer winter habitat and high-value marten habitat. Previous clearcuts to the north and east may have impacted dispersal/travel corridors between alpine and beach fringe.

Mitigation: W6, W7. Provide for greater habitat diversity over time by using uneven-age management and retaining non-merchantable trees and snags.

Visual/Recreation

Concern: Meet the maximum modification or Partial Retention VQO. Approximately 24 acres are visible from Icy Strait (KVA 4), Homeshore Bay (KVA 2), and the LTF (KVA 3).

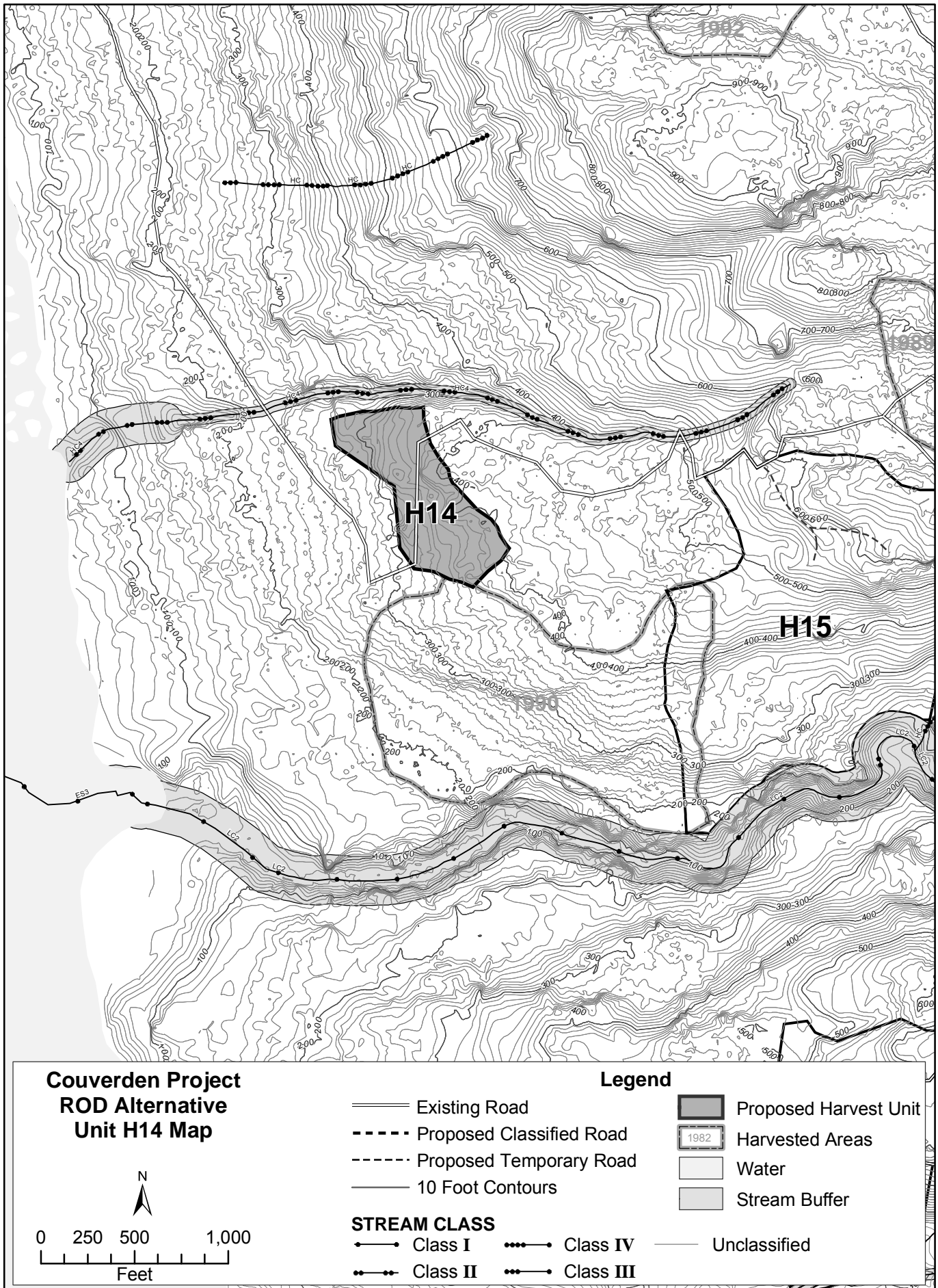
Mitigation: V5. Patch cuts will be used to reduce visual contrast on benches. V6. Trees 16" DBH and smaller, plus 5 trees per acre at least 20" DBH, will be left on steeper slopes. V7. Leave most non-merchantable trees to help reduce visual contrast.

Other Resources/Issues

Concern: None

Mitigation:

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COUVERDEN TIMBER SALE(S) - UNIT CARD Unit No. H14 ROD Alternative

Harvest Method: Shovel & short skyline

Total Acres: 10

Total Volume: 144 MBF

Volume per Acre: 19 MBF

UNIT DEVELOPMENT

Unit designed to meet VQO of partial retention. Unit boundaries are based on Alternative 3. The following mitigation measures were either taken into account during unit design, or they will be applied during project implementation: F1, F2, T1, W6, W7, V5, V6, and V7.

Logging and Transportation: The timber can be yarded with a shovel and short skyline system using the existing road as a continuous roadside landing. Short skyline system will be used below Road 8553, above road is shovel yarding. Class III stream along the northern boundary will require a slope break buffer (BMP 12.6(a), 13.16). There are some concerns for windthrow along the northern boundary. This unit is partially visible from saltwater.

Classified Roads: No new classified roads will be needed to access the unit. Except for 0.8 mile of the 8550 road, existing roads will remain open and would be available for OHV use.

Temporary Roads: No temporary road will be needed to access the unit.

Stand Management Objectives: The future stand will be two-aged, tending towards uneven-age over time with a mix of large- and medium-size trees and seedlings and saplings.

Treatment: Single tree selection and group selection. Diameter cut below the road and group selection above the road. Diameter cut will leave trees less than 16" DBH, plus 5 trees per acre at least 20" DBH. Retention trees should be selected based on windfirmness and should be distributed as to minimize visual impacts. The group selection will consist of logging 2-acre areas harvesting about half the area above the road.

Regeneration Method: T1. Natural regeneration. The new stand is likely to be mostly hemlock.

Possible Future Treatments: Possible planting if natural regeneration does not result in fully stocked stand or to increase species diversity; release and pre-commercial thinning may be needed in patch cuts. Similar harvests every 50 to 60 years. Future entries will maintain a minimum of 10% by volume of the stand in mature trees and 20% retention trees.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: A large Class III stream borders the north part of the unit. This stream channel has signs of sliding on the north channel sideslope. Electrofishing downstream confirmed that only resident fish (Dolly Varden and cutthroat trout) are present in this stream about 800 feet below this unit to saltwater.

Mitigation: F1. Class III channel: no programmed harvest within V-notch or side slope break of the channel. Manage the area beyond (approximately one site-potential tree height, about 120 feet) for reasonable assurance of windfirmness. Any slide areas along this bank should receive an additional buffer. F2. Directional felling along buffers.

Soils/Wetlands/Karst

Concern: None

Mitigation:

Wildlife/TES Plants

Concern: W6, W7. No concern because habitat diversity on a stand level is provided over time by using the selection method (uneven-aged system) as a harvest prescription.

Mitigation:

Visual/Recreation

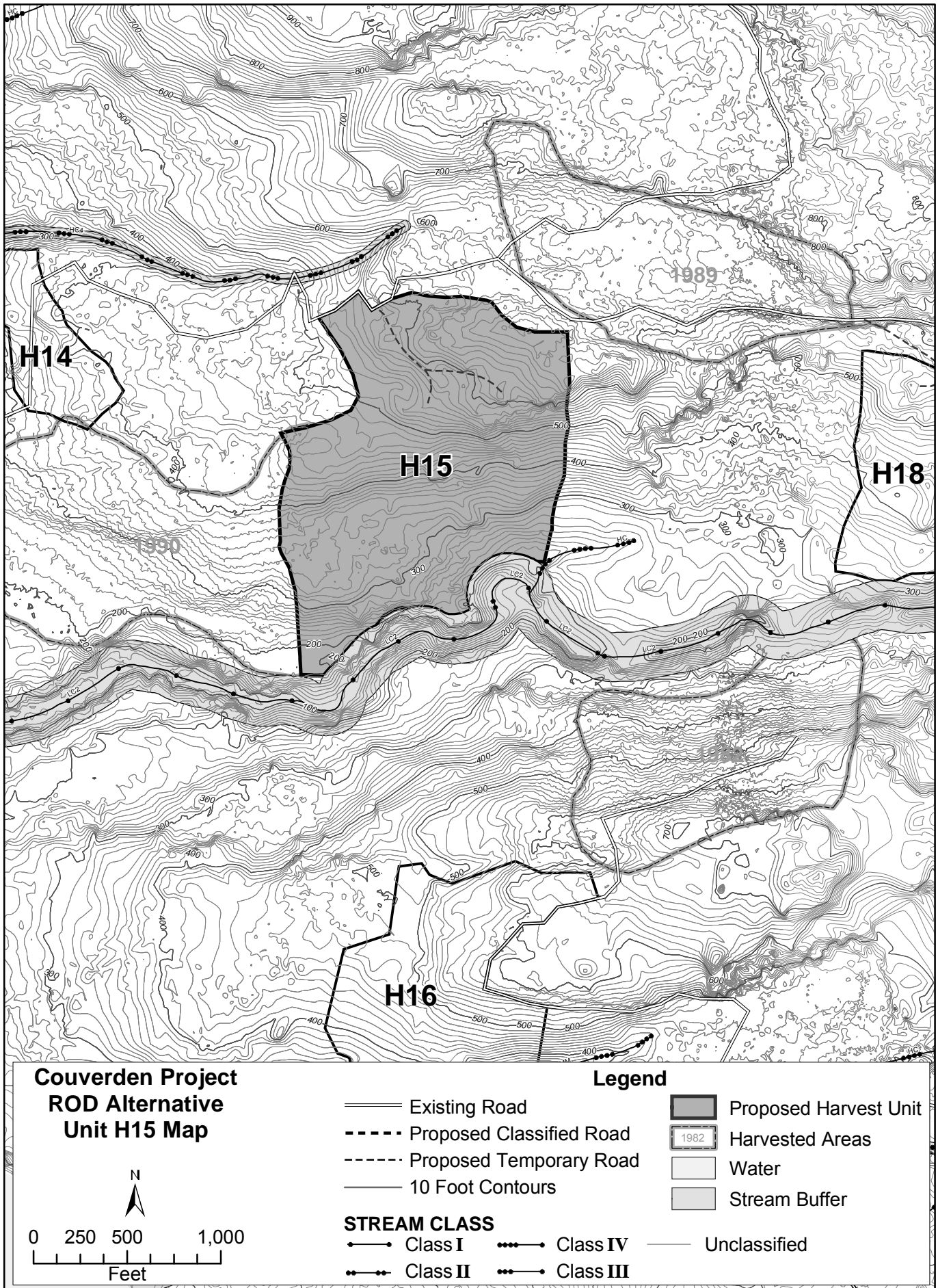
Concern: Meet the partial retention VQO. Approximately 10 acres of the harvested unit would be visible as background by observers from Icy Strait and Homeshore Bay (KVAs 4 and 2, respectively).

Mitigation: V5. Patch cuts will be used to reduce visual contrast on benches. V6. Trees 16" DBH and smaller, plus 5 trees per acre at least 20" DBH, will be left on steeper slopes. V7. Leave most non-merchantable trees to help reduce visual contrast.

Other Resources/Issues

Concern: None

Mitigation:



COUVERDEN TIMBER SALE(S) - UNIT CARD Unit No H15

ROD Alternative

Harvest Method: Shovel, Short Skyline & Long Skyline

Total Acres: 50

Total Volume: 1,156 MBF

Volume per Acre: 26 MBF

UNIT DEVELOPMENT

Unit designed to meet VQO of partial retention. Unit boundaries are based on Alternative 3; however, boundaries were extended to include unroaded and SEIS roadless areas but do not include Inventoried Roadless Areas covered by the Roadless Rule. The following mitigation measures were either taken into account during unit design, or they will be applied during project implementation: F1, F2, F14, T1, W1, W7, V1, and V7.

Logging and Transportation: The timber can be yarded using a shovel, short skyline, and long skyline systems. There are three settings within the unit. Setting A is a long skyline system using the landing locations at the end of temporary spurs. Tail holds south of Humpy Creek will be needed to attain partial suspension in the southwest corner. Setting B is a short skyline system using the landing location at the southern end of setting boundary. Setting C is shovel yarding. Timber will be yarded to the proposed temporary spur. A Class I stream along the southern boundary will require directional felling away from slope break buffer. (BMP 12.6(a), 13.16). The east boundary may have potential for windthrow after harvest. The unit is partially visible from saltwater.

Classified Roads: No new classified roads will be needed to access the unit. Except for 0.8 mile of the 8550 road, existing roads will remain open and would be available for OHV use.

Temporary Roads: Approximately 0.19 mile of temporary road is needed. The temporary road will be obliterated after use.

Stand Management Objectives: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Treatment: Clearcut with reserves. Reserve trees, snags, and non-merchantable trees should be left as patches along steep slopes in the upper-middle of the unit. This prescription would optimize the regeneration potential for fiber production (especially for spruce), reduce mistletoe and windthrow, and would be the most economical harvest method. The prescription is appropriate to meet wildlife, watershed, and other resource objectives. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old-growth trees in original harvest, plus enough large second-growth trees to meet the 10% reserve requirement.

Regeneration Method: T1. Natural regeneration. The majority of unit is hemlock.

Possible Future Treatments: Possible planting if natural regeneration does not result in fully stocked stand or to increase species diversity, release, and pre-commercial thinning. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old-growth trees in original harvest, plus enough large second-growth trees to meet the 10% reserve requirement.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries:

Concern: Humpy Creek, a large Class I stream, borders the unit to the south. One Class IV stream crosses the southeast unit corner. Humpy Creek is a large LC2 channel in a steep walled canyon along the unit boundary.

Mitigation: F1. Humpy Creek: allow no commercial harvest within 100 feet of the channel. Also, no programmed commercial harvest within the riparian area (typically up to 190 feet for LC2 channels) or 100 feet (the height of one site-potential tree), whichever is greater. Manage the area beyond (approximately one site-potential tree height) for reasonable assurance of windfirmness. The canyon slopes in this region exceed 130 feet horizontal distance along the unit boundary. Ensure that tailholds anchored in south bank area of Humpy Creek are out of the riparian region if possible and that riparian trees are not removed during yarding operations. F2. Directional fell away from Class IV stream along southeast unit boundary.

Soils/Wetlands/Karst

Concern: There are two landslides within 0.5 mile of unit. There is a 0.5-acre patch of >72% slopes along eastern edge of unit (Alternatives 2 and 3). There are steep slopes above Class I stream below the south side of unit.

Mitigation: F1. Maintain stream and windfirm buffer (BMP 12.6(a), 13.16) to protect Class I stream. F14. Avoid harvest on slopes >72% and unstable slopes (BMP 13.5).

Record of Decision

Wildlife

Concern: Unit contains high value deer winter habitat and high value marten habitat. Previous clearcuts adjacent to unit may have impacted wildlife movements in this area.

Mitigation: W1, W7. Leave live reserve trees, large culls, and snags where possible to maintain habitat structure and snag density. Concentrate leave trees around stream buffers, culls, and snags to ensure windfirmness.

Visual/Recreation

Concern: Meet the partial retention VQO. Approximately 21 acres in the harvested unit would be visible in the background from Icy Strait (KVA 2).

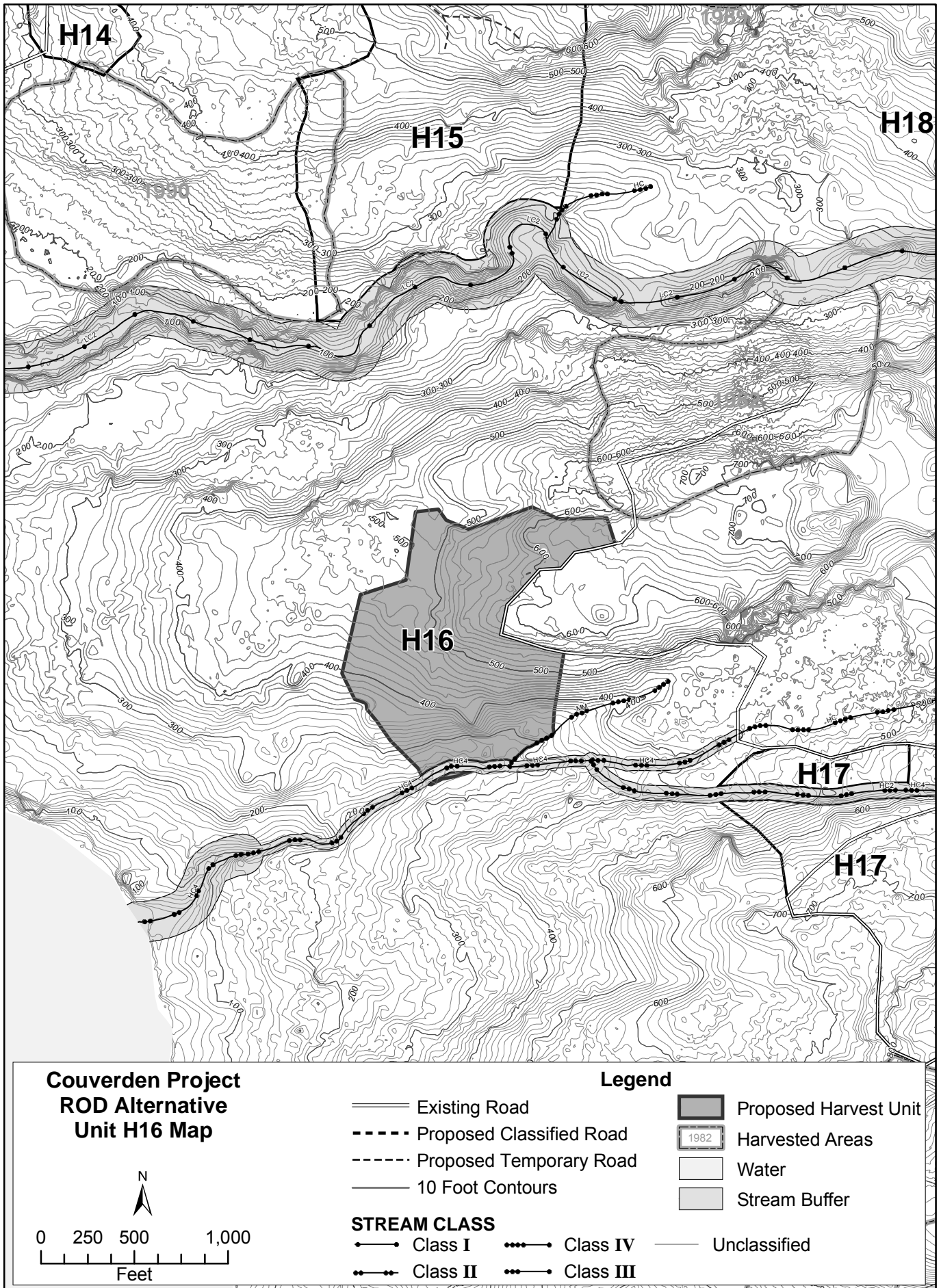
Mitigation: V1. Reserve trees would be concentrated in visible areas and steep areas to reduce visual contrast. V7. Leave most non-merchantable trees to help reduce visual contrast.

Other Resources/Issues

Concern: None

Mitigation:

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COUVERDEN TIMBER SALE(S) - UNIT CARD Unit No. H16

ROD Alternative

Harvest Method: Long skyline

Total Acres: 28

Total Volume: 1,291 MBF

Volume per Acre: 51 MBF

UNIT DEVELOPMENT

Unit designed to meet VQO of partial retention. Unit boundaries are based on Alternative 3. The following mitigation measures were either taken into account during unit design, or they will be applied during project implementation: F1, F2, F3, F14, T1, W1, W7, V1, and V7.

Logging and Transportation: The timber can be yarded using a long skyline system. One landing is needed to log the entire unit. A minimum tower height of 70 feet is needed to maintain partial suspension at the slope break below the landing. Tailholds will be needed outside the unit. There are two streams along the southern boundary of the unit. They will require directional felling away from slope break buffer (BMP 12.6(a), 13.16). There is a minor amount of windthrow in the northeast corner along the old clearcut. The top one-third of the unit is visible from saltwater.

Classified Roads: No new classified roads will be needed to access the unit. Except for 0.8 mile of the 8550 road, existing roads will remain open and would be available for OHV use.

Temporary Roads: No temporary roads will be needed.

Stand Management Objectives: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Treatment: Clearcut with reserves. Reserve trees, snags, and non-merchantable trees should be left as patches distributed as to reduce visual impacts. The area across the Class III stream was dropped from the unit. This prescription would optimize the regeneration potential for fiber production (especially for spruce), reduce mistletoe, and would be the most economical harvest method. The prescription is appropriate to meet wildlife, watershed, and other resource objectives.

Regeneration Method: T1. Natural regeneration. Majority of unit is hemlock.

Possible Future Treatments: Possible planting if natural regeneration does not result in fully stocked stand or to increase species diversity, release, and pre-commercial thinning. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old-growth trees in original harvest, plus enough large second-growth trees to meet the 10% reserve requirement.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: A Class III stream borders the unit to the south and a Class IV stream enters this stream near the southeast corner. The Class III stream was originally designated as Class II on the GIS database; however, electrofishing the reach along, and downstream of, the unit collected no fish. The increasing stream channel gradient and lack of fish resulted in the channel being reclassified as a Class III. This stream enters saltwater about 1,400 feet downstream of where sampling occurred. An area with steep slopes is present along the southern portion of the unit, 500 feet upslope from the stream. This area may be unstable and may be a source of sediment entering the stream if this area is disturbed.

Mitigation: F14. Avoid harvest of the steep slopes above the boundary stream. F1. No programmed harvest within the V-notch or sideslope break of this Class III channel. Manage the area beyond (approximately one site-potential tree height, about 120 feet) for reasonable assurance of windfirmness. F2, F3. The Class IV channel may require directional felling, splitline, partial, or full suspension.

Soils/Wetlands/Karst

Concern: There are about 2.1 acres of >55% slopes.

Mitigation: F14. Avoid harvest on unstable slopes (BMP 13.5). A soil scientist of geomorphology should participate in unit layout.

Wildlife

Concern: Unit contains high-value deer winter habitat throughout and high-value marten habitat in the southern half of unit and borders Class III to south.

Mitigation: W1, W7. Leave live reserve trees, large culls, and snags where possible to maintain habitat structure and snag density. Concentrate leave trees around large culls and snags to ensure windfirmness.

Record of Decision

Visual/Recreation

Concern: Meet the partial retention VQO. Approximately 12 acres of the harvested unit would be visible as background from Icy Strait, the LTF, and Homeshore Bay (KVAs 4, 3, and 2, respectively).

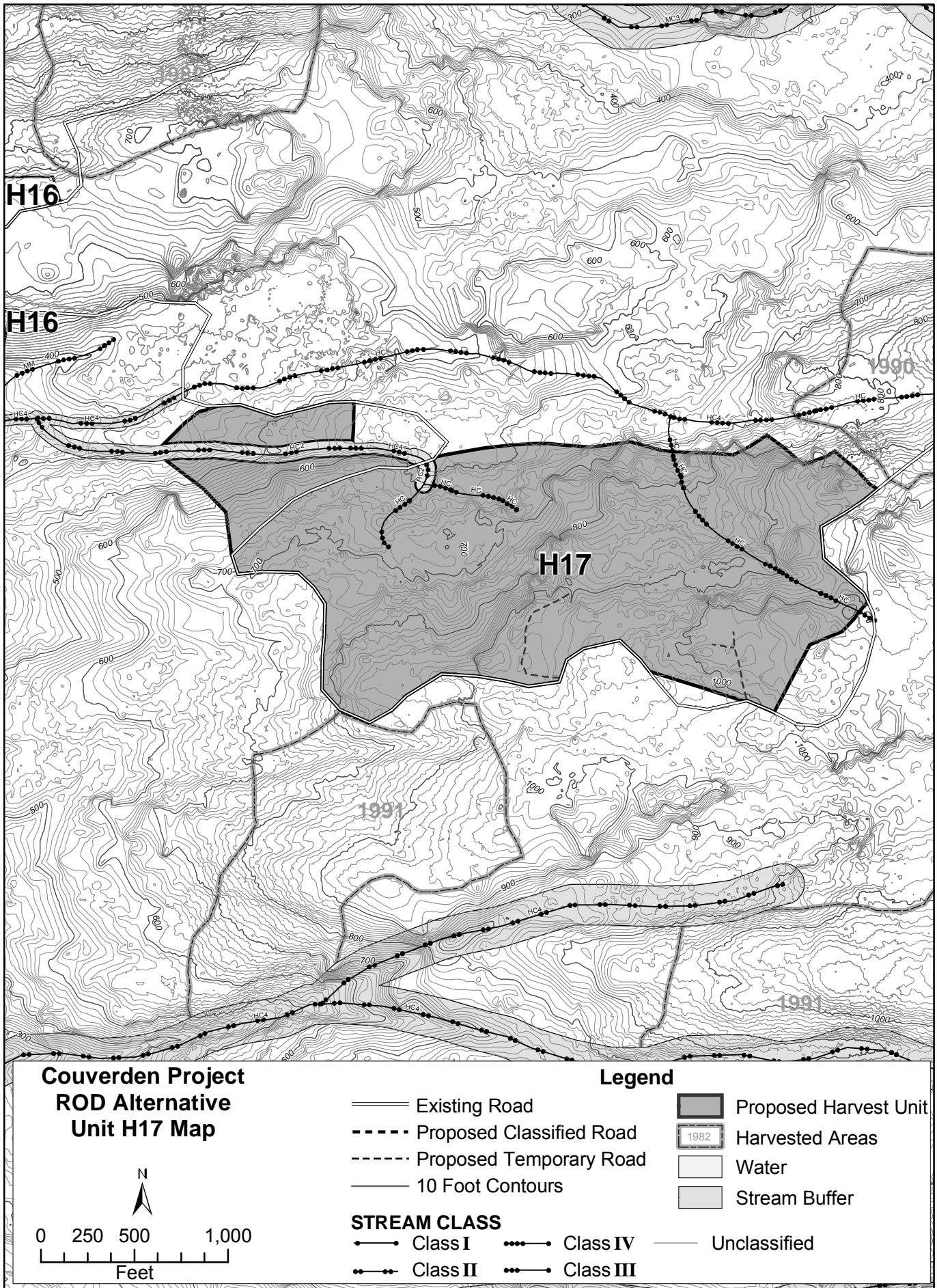
Mitigation: V1. Reserve trees would be concentrated in visible areas and steep areas to reduce visual contrast. V7. Leave most non-merchantable trees to help reduce visual contrast.

Other Resources/Issues

Concern: None

Mitigation:

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COUVERDEN TIMBER SALE(S) - UNIT CARD Unit No. H17

ROD Alternative

Harvest Method: Shovel, Short Skyline & Long SkylineTotal Acres: 91Total Volume: 1,227 MBFVolume per Acre: 17 MBF**UNIT DEVELOPMENT**

Unit designed to meet VQO of partial retention. Unit boundaries are based on Alternative 3. The following mitigation measures were either taken into account during unit design, or they will be applied during project implementation: F1, F2, F3, F14, T1, W6, W7, V1, V6, and V7.

Logging and Transportation: The timber can be yarded using a shovel, short skyline, and long skyline systems. There are nine settings within this unit. Settings A, C, and F are all shovel logging using the existing road as roadside landing. Settings B, D, E, and G are all long skyline system. This system will be used on steeper slopes. All landings have good guyline stumps. Setting B is short skyline system using the existing road as a continuous roadside landing. A Class III stream along the northern boundary will require directional felling away from slope break buffer. The Class IV stream within the unit will be split yarded or partially suspended (BMP 12.6(a), 13.16). The only windthrow concerns would be the western boundary and the Class III stream buffer. Half the unit is visible from saltwater.

Classified Roads: No new classified roads will be needed to access the unit. Except for 0.8 mile of the 8550 road, existing roads will remain open and would be available for OHV use.

Temporary Roads: Three temporary roads will be needed. The northeast road is approximately 0.11 mile and ends at a large landing. The southeast road is approximately 0.09 mile with two landing locations. The southern road is approximately 0.15 mile and ends at a large landing. The temporary roads will be obliterated after use.

Stand Management Objectives: The future stand will be two-aged, tending towards uneven-age over time with a mix of large- and medium-size trees and seedlings and saplings.

Treatment: Single tree selection and group selection. Diameter cut will be used on sloped areas facing the saltwater; group selection will be used on the benches and on all areas yarded downhill. Group selection areas would allow for spruce regeneration while meeting the VQO requirements. Diameter cut will consist of leaving trees 16" DBH and smaller, plus 5 trees greater than 20" DBH per acre. Retention trees should be selected based on windfirmness and should be distributed as to minimize visual impacts. Group selection will consist of logging 2-acre patches, harvesting about half the area.

Regeneration Method: T1. Natural regeneration. Majority of unit is hemlock.

Possible Future Treatments: Possible planting if natural regeneration does not result in fully stocked stand or to increase species diversity; release and pre-commercial thinning may be needed in the patch cut areas. Similar harvests every 50 to 60 years. Future entries will maintain a minimum of 10% by volume of the stand in mature trees and 20% retention trees.

RESOURCE CONCERNS & MITIGATION**Watershed/Fisheries**

Concern: There are one Class III in the northwest unit corner and three Class IV stream segments in the unit. There is a Class IV stream to the north of the unit. The Class III stream was originally designated as Class II. It was changed to a Class III after electrofishing 1,500 feet downstream of the unit did not find any fish.

Mitigation: F1. The Class III channel should have no programmed harvest within the V-notch or sideslope break of the Class III channel. Manage the area beyond (approximately one site-potential tree height, about 120 feet) for reasonable assurance of windfirmness. F2, F3. The three Class IV channels present within the unit may require directional felling, splitline, partial, or full suspension.

Soils/Wetlands/Karst

Concern: There are 1.7 acres of slopes >72% along western edge of unit.

Mitigation: F14. Avoid harvest on slopes >72% and unstable slopes (BMP 13.5).

Wildlife

Concern: Unit contains medium-value deer winter habitat and medium- to high-value marten habitat through center of unit running north and south.

Mitigation: W6, W7. Provide greater habitat diversity by using uneven-aged management and retaining non-merchantable trees and snags.

Record of Decision

Visual/Recreation

Concern: Meet the Partial Retention or Maximum Modification VQO. Approximately 57 acres of the harvested unit would be visible from Icy Strait (KVA 4) and Homeshore Bay (KVA 2).

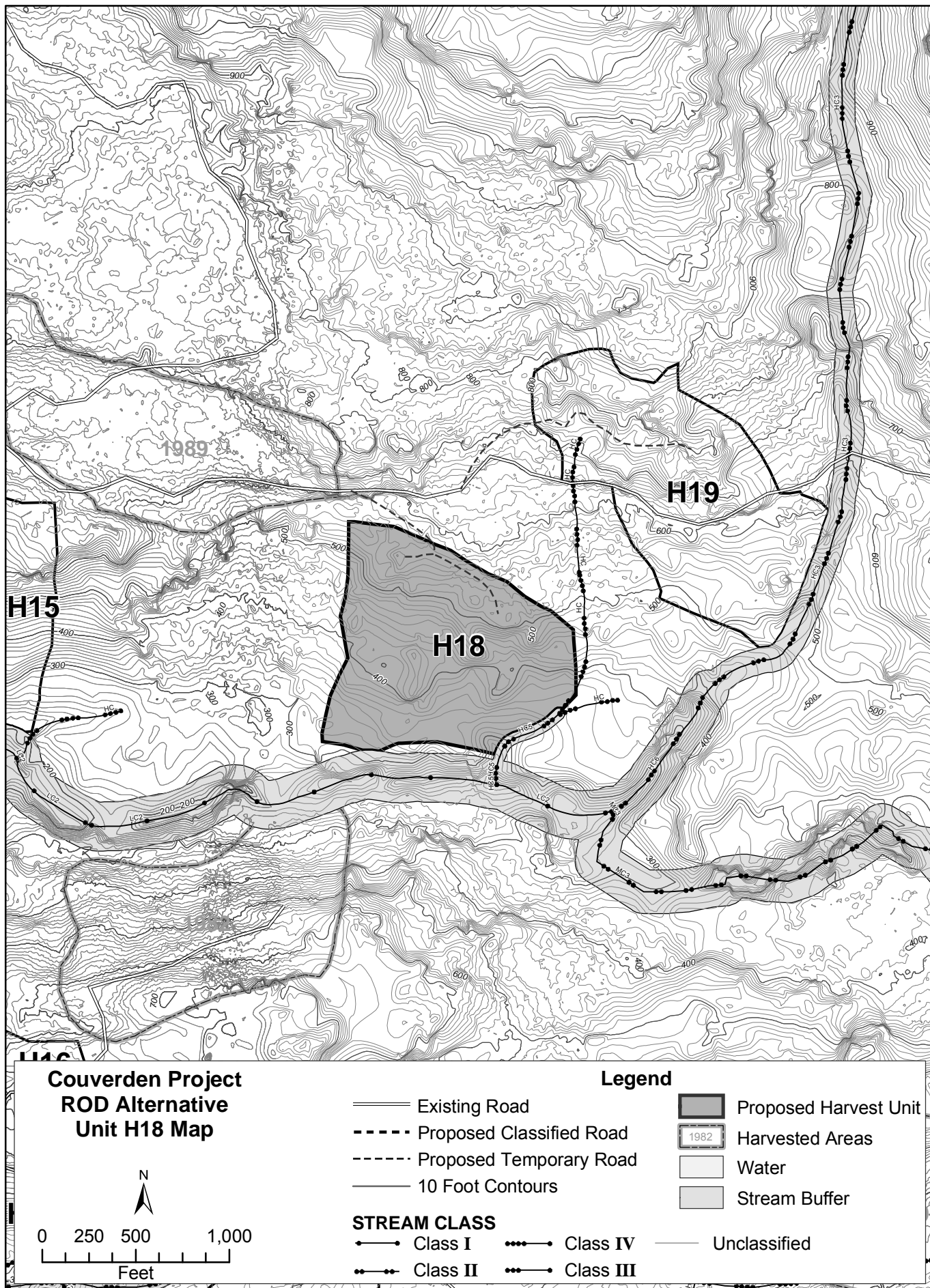
Mitigation: V6. Leave trees 16" DBH and smaller, plus 5 trees per acre at least 20" DBH to reduce visual contrast. V7. Leave most non-merchantable trees to help reduce visual contrast. V1. Reserve trees would be concentrated in the visible areas, especially in areas with an intermediate VAC (e.g., the steeper areas).

Other Resources/Issues

Concern: None

Mitigation:

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COUVERDEN TIMBER SALE(S) - UNIT CARD Unit No. H18

ROD Alternative

Harvest Method: Short skylineTotal Acres: 27Total Volume: 506 MBFVolume per Acre: 21 MBF**UNIT DEVELOPMENT**

Unit designed to meet VQO of partial retention. Unit boundaries are based on Alternative 3; however, boundaries were extended to include unroaded and SEIS roadless areas but do not include Inventoried Roadless Areas covered by the Roadless Rule. The following mitigation measures were either taken into account during unit design, or they will be applied during project implementation: F1, F2, F3, F10, F14, T1, W1, W7, V1, and V7.

Logging and Transportation: The timber can be yarded using a short skyline with the two landing locations along the northern boundary. The guyline anchors for landing located in Setting B are poor. Deadmen anchors can be used to the north and east of the landing. Class I stream along the southern boundary and a Class III/IV stream along the eastern boundary will require directional felling away from slope break buffer (BMP 12.6(a), 13.16). Windthrow is not expected to be a problem after harvest. Unit is not visible from saltwater.

Classified Roads: No new classified roads will be needed to access the unit. Except for 0.8 mile of the 8550 road, existing roads will remain open and would be available for OHV use.

Temporary Roads: Approximately 0.24 mile of temporary road will be needed. The temporary road will be obliterated after use.

Stand Management Objectives: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Treatment: Clearcut with reserves. Reserve trees, snags, and non-merchantable trees throughout the unit. This prescription would optimize the regeneration potential for fiber production (especially for spruce), reduce mistletoe, and would be the most economical harvest method. The prescription is appropriate to meet wildlife, watershed, and other resource objectives.

Regeneration Method: T1. Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

Possible Future Treatments: Possible planting if natural regeneration does not result in fully stocked stand or to increase species diversity, release, and pre-commercial thinning. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old-growth trees in original harvest, plus enough large second-growth trees to meet the 10% reserve requirement.

RESOURCE CONCERNS & MITIGATION**Watershed/Fisheries**

Concern: Humpy Creek, a Class I stream, borders the unit to the south. The Class III stream changing to Class IV forms part of the east unit boundary. The canyon along Humpy Creek is very steep and incised. The Class III channel is moderately incised (35 feet) and steep (70 % sideslope), especially as it approaches Humpy Creek.

Mitigation: The unit does not reach to Humpy Creek under these alternatives; therefore, no mitigation is needed for this stream. F1. No commercial harvest within 100 feet of Humpy Creek. No programmed harvest within the riparian area (typically up to 190 feet for LC2 channels). Manage the area beyond (approximately one site potential tree height or 100 feet, whichever is greater) for reasonable assurance of windfirmness. Class III channel in the southeast should have no programmed harvest within the V-notch or sideslope break of the channel. Manage the area beyond (approximately one site-potential tree height, about 120 feet) for reasonable assurance of windfirmness. F2, F3. The Class IV portion of this stream channel may require directional felling, splitline, partial, or full suspension present within the unit.

Soils/Wetlands/Karst

Concern: There are two landslides within 0.5 mile of the unit. There are steep slopes below the south end of the unit within the Class I stream buffer. There are wetlands north of the unit.

Mitigation: F1. Maintain stream and windfirm buffer (BMP 12.6(a), 13.16) to protect Class I and III streams. F14. Avoid harvest on unstable slopes (BMP 13.5). F10. Modify the location of temporary road to minimize impacts to wetlands.

Record of Decision

Wildlife

Concern: Unit contains high-value deer winter habitat and high-value marten habitat throughout, except for the northwest corner.

Mitigation: W1, W7. Leave live reserve trees, large culls, and snags where possible to maintain habitat structure and snag density. Leave trees around large culls and snags to ensure windfirmness and along Humpy Creek to maximize any windfirm buffering that may be required.

Visual/Recreation

Concern: Meet the Maximum Modification VQO. Approximately 4 acres of the harvested unit would be visible as background from Icy Strait (KVA 4).

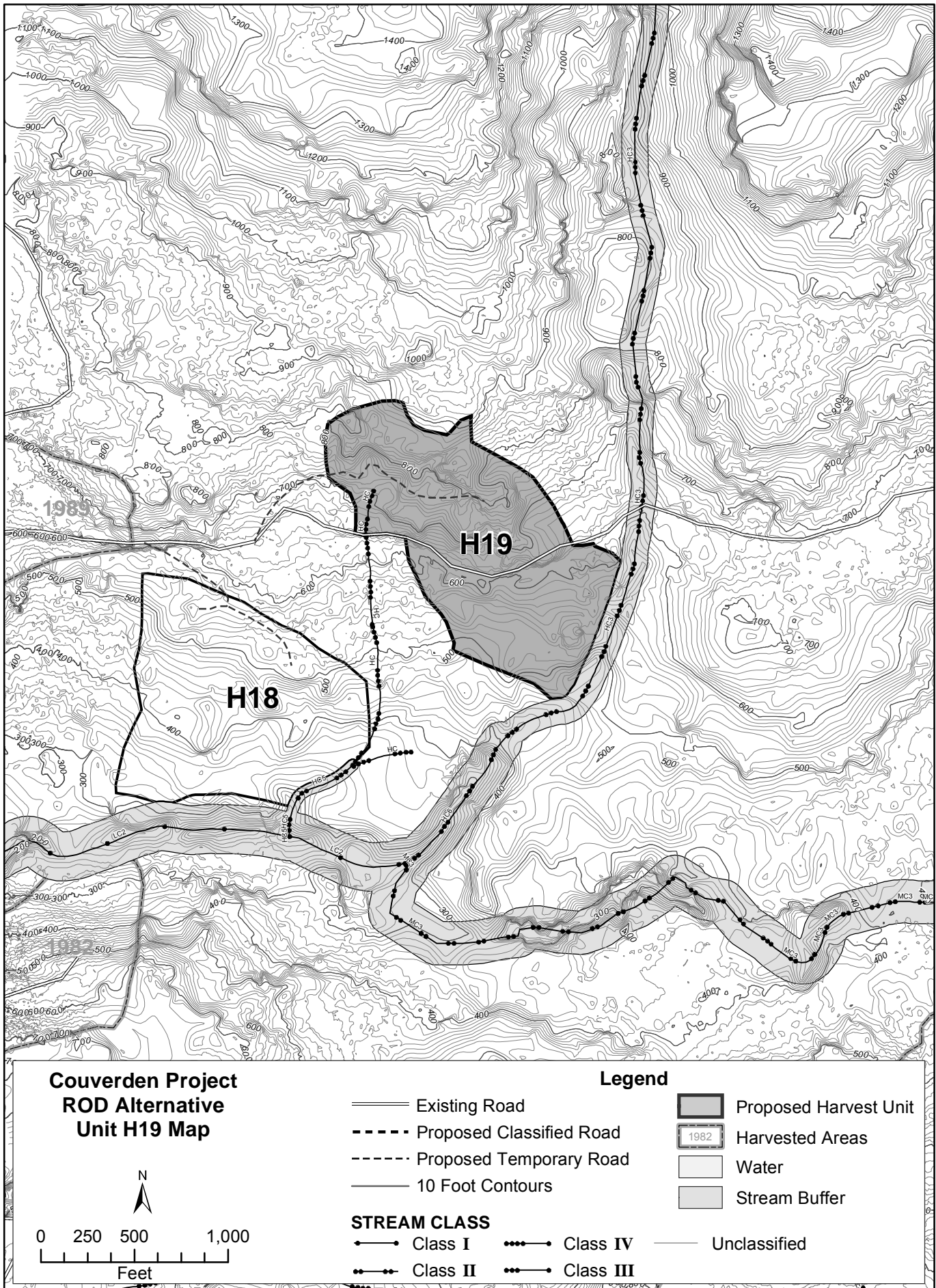
Mitigation: V1. Reserve trees would be concentrated in visible areas and steep areas to reduce visual contrast. V7. Leave most non-merchantable trees to help reduce visual contrast.

Other Resources/Issues

Concern: None

Mitigation:

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COUVERDEN TIMBER SALE(S) - UNIT CARD Unit No. H19

ROD Alternative

Harvest Method: Short skylineTotal Acres: 30Total Volume: 645 MBFVolume per Acre: 24 MBF**UNIT DEVELOPMENT**

Unit designed to meet VQO of maximum modification. Unit boundaries are based on Alternative 3. The following mitigation measures were either taken into account during unit design, or they will be applied during project implementation: F1, F2, F3, F10, F14, F15, W1, W7, T1, V1, and V7.

Logging and Transportation: The timber can be yarded with a short skyline system using the road as a continuous roadside landing. The area south of Road 8553 will be yarded to the existing road. The area north of Road 8553 will be yarded to three landing locations along the proposed temporary road. There are no guyline or tail hold anchor problems. The Class III stream along the southeastern boundary will require directional felling away from slope break buffer (BMP 12.6(a), 13.16). The Class IV stream in the northwest corner of the unit can be split yarded. The upper third of the unit is visible from saltwater.

Classified Roads: No new classified roads will be needed to access the unit. Except for 0.8 mile of the 8550 road, existing roads will remain open and would be available for OHV use.

Temporary Roads: Approximately 0.28 mile of temporary road will be needed. The temporary road will be obliterated after use.

Stand Management Objectives: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Treatment: Clearcut with reserves. Reserve trees, snags, and non-merchantable trees would be left mostly near the west boundary. See the Visual/Recreation section. This prescription would optimize the regeneration potential for fiber production (especially for spruce), reduce mistletoe, and would be the most economical harvest method. The prescription is appropriate to meet wildlife, watershed, and other resource objectives.

Regeneration Method: T1. Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

Possible Future Treatments: Possible planting if natural regeneration does not result in fully stocked stand or to increase species diversity, release, and pre-commercial thinning. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old-growth trees in original harvest, plus enough large second-growth trees to meet the 10% reserve requirement.

RESOURCE CONCERNS & MITIGATION**Watershed/Fisheries**

Concern: A Class III tributary to Humpy Creek borders the unit on the southeast and a Class IV channel drains the western portion of the unit. The creek in this area is in a large V-notch. Electrofishing 500 feet downstream of this unit did not capture any fish. Barrier falls are present along, and downstream of, the unit. This information was used to determine this was a Class III channel.

Mitigation: F1. The Class III stream should have no programmed harvest within the V-notch or side slope break of the Class III channel. Manage the area beyond (approximately one site-potential tree height, about 120 feet) for reasonable assurance of windfirmness. F2, F3. The Class IV stream in the west may require directional felling, splitline, partial, or full suspension for the channel present within the unit.

Soils/Wetlands/Karst

Concern: There are two landslides to the west of the unit along the same valley slope. The proposed temporary road runs along the same slope as landslides to the west. There are wetlands west of unit.

Mitigation: F14. Avoid harvest on unstable slopes (BMP 13.5). F15. Ensure road is placed on stable portion of slope (BMP 14.2, 14.7). F10. Modify temporary road location to avoid impacts to wetlands.

Record of Decision

Wildlife

Concern: South half of unit (below road) contains high-value deer winter habitat and medium- to high-value marten habitat.

Mitigation: W1, W7. Leave live reserve trees, large culls, and snags where possible to maintain habitat structure and snag density. Leave trees around large culls and snags to ensure windfirmness and along creek to maximize any windfirm buffering that may be required.

Visual/Recreation

Concern: Meet VQO of maximum modification. Approximately 13 acres of the harvested unit would be visible as background from Icy Strait (KVA 4).

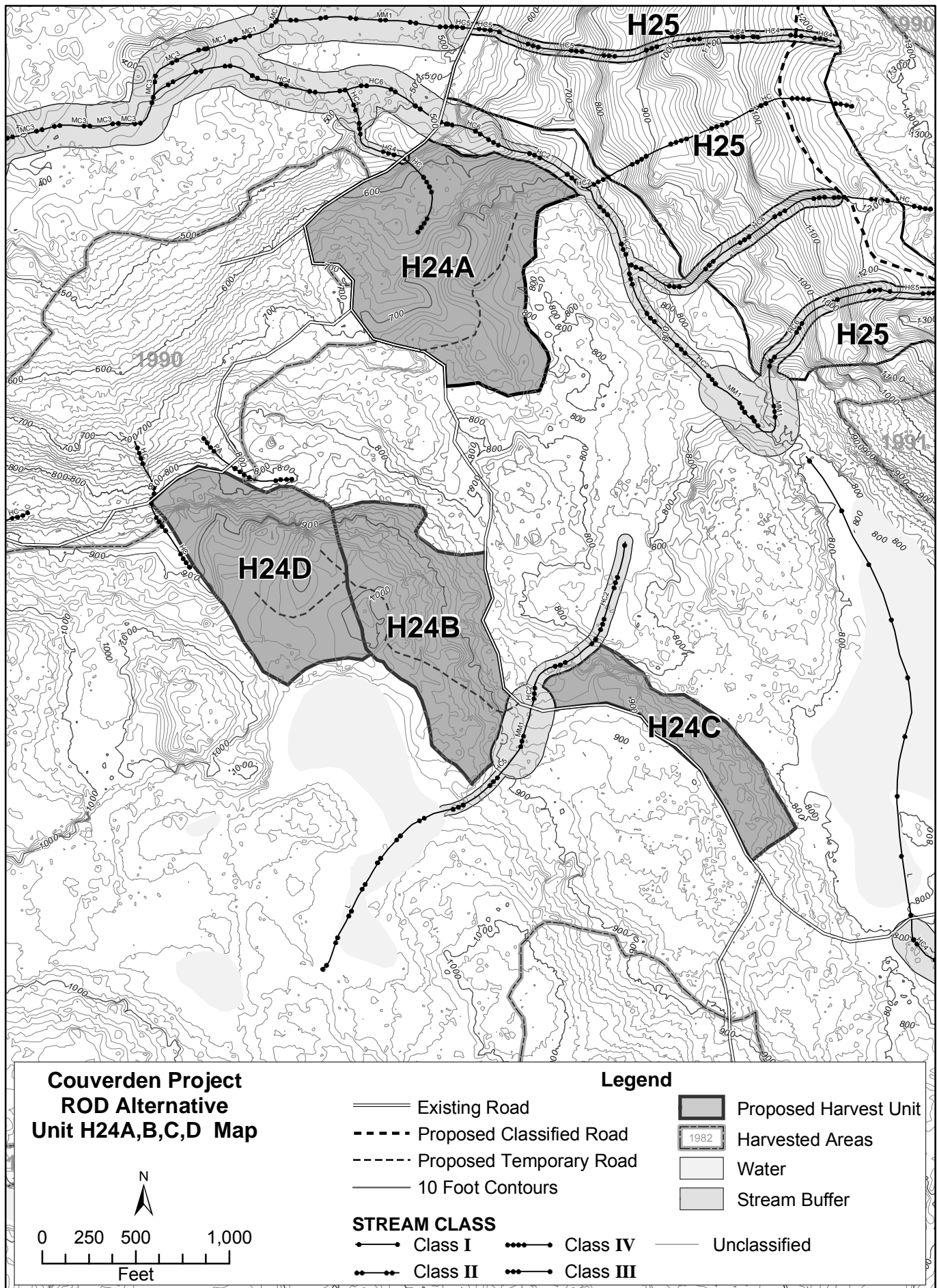
Mitigation: V1. Reserve trees would be concentrated in visible areas and steep areas to reduce visual contrast. V7. Leave most non-merchantable trees to help reduce visual contrast. In addition, trees will be left below the road to mitigate visual impacts of road construction.

Other Resources/Issues

Concern: None

Mitigation:

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COUVERDEN TIMBER SALE(S) - UNIT CARD Unit No. H24

ROD Alternative

Harvest Method: Shovel & Short Skyline

Total Acres: 72

Total Volume: 1,179 MBF

Volume per Acre: 18 MBF

UNIT DEVELOPMENT

Unit designed to meet VQO of maximum modification. Unit boundaries are based on Alternative 3. The following mitigation measures were either taken into account during unit design, or they will be applied during project implementation: F1, F2, F3, F10, W1, W7, T1, V1, and V7.

Logging and Transportation: The timber can be yarded using shovel and short skyline system using the existing and proposed temporary roads as continuous roadside landings. There are three settings. Setting A in the northern end of the unit will be a short skyline system. Yarding timber to the existing road and the proposed temporary spur. Some shovel logging east of temporary road is feasible. Tail trees are available in this setting. Class IV stream in Setting A can be split yarded for protection. Windthrow is not expected to be a problem after harvest. Settings B and D will be yarded using a short skyline system using continuous roadside landings to the Road 8553. Unit has inclusions of low quality and volume timber that could be left as reserve areas in the unit. Class III stream, along the southern and northern boundary of Setting B, will require slope break buffer. (BMP 12.6(a), 13.16). Windthrow is not expected to be a problem after harvest. About one-fourth of Setting B is visible from saltwater. See the Visual/Recreation section. Setting C yarding will be short skyline system using continuous roadside landings to the Road 8553. Unit has inclusions of low quality and volume timber that could be left as reserve areas in the unit. Class III stream, along the southern and northern boundary of Setting B and C will require slope break buffer. (BMP 12.6(a), 13.16). Windthrow is not expected to be a problem after harvest.

Classified Roads: No new classified roads will be needed to access the unit. Except for 0.8 mile of the 8550 road, existing roads will remain open and would be available for OHV use.

Temporary Roads: Two temporary roads will be needed; a 0.19 mile temporary road will be needed in Setting A and a 0.38 mile temporary road will be needed in Setting B. The temporary roads will be obliterated after use.

Stand Management Objectives: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Treatment: Clearcut with reserve trees. Reserve trees, snags, and non-merchantable trees leave to minimize visual impacts. See the Visual/Recreation section. This prescription would optimize the regeneration potential for fiber production (especially for spruce), reduce mistletoe, and would be the most economical harvest method. As well the prescription is appropriate to meet wildlife, watershed, and other resource objectives.

Regeneration Method: T1. Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

Possible Future Treatments: Possible planting if natural regeneration does not result in fully stocked stand or to increase species diversity, release, and pre-commercial thinning. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old-growth trees in original harvest, plus enough large second-growth trees to meet the 10% reserve requirement.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: The unit is bordered by two lakes (Class I and II), one Class II stream, two Class III streams, and three Class IV streams. The Class I lake borders the northeast portion of H24C. Minnow traps determined that Dolly Varden were present in this lake. The other lake borders the southwest corner of H24B and H24D. Electrofishing the stream exiting this lake captured no fish, so fish presence in this lake is unlikely. A Class II stream borders H24A to the north. Electrofishing of this stream determined that Dolly Varden were present only below a barrier in the lower 150 feet of the unit. The stream continues as a Class III upstream, forming the unit boundary. Another Class III stream borders unit sections H24B and H24C. Two Class IV streams border H24D to the north and northeast, and one Class IV stream drains a small central area of H24A. The lower part of this stream has Class III characteristics just before exiting the unit and is a Class III below the road. Resident fish habitat is likely to be present within 400 feet of the unit based on topography and proximity to an adjacent Class II stream.

Record of Decision

Mitigation: F1. Both lakes: no programmed commercial harvest within 100 feet of the lake margin or riparian area (typically the height of one site-potential tree), whichever is greater. An additional 100 feet, the area beyond this area, is recommended to protect the scenic values of the Class I lake. Manage the area beyond this area (approximately one site-potential tree height) for reasonable assurance of windfirmness for both lakes. The Class II stream to the north should have no commercial harvest within 100 feet of Class II channel, or the top of the V-notch, whichever is greater. Manage the area beyond (approximately one site-potential tree height, about 120 feet) for reasonable assurance of windfirmness. The two Class III channels: no programmed harvest within the V-notch or sideslope break of the Class III channel. Manage the area beyond (approximately one site-potential tree height about 120 feet) for reasonable assurance of windfirmness. F 2, F3. The three Class IV segments may require directional felling, splitline, partial, or full suspension for Class IV channels present within the unit.

Soils/Wetlands/Karst

Concern: There are wetlands south of the unit.

Mitigation: F10. Modify road location to avoid impacts to wetlands.

Wildlife

Concern: Medium- and high-value marten habitat was identified in H24A, and Vancouver Canada goose with seven goslings were observed near south end of H24C. A deer antler was also found in H24C.

Mitigation: W1, W7. Leave live reserve trees, large culls, and snags where possible to maintain habitat structure and snag density throughout. Concentrate leave trees around large culls and snags to ensure windfirmness. If other nests are located during implementation, provide a minimum distance of 330 feet between harvest activities and nest site.

Visual/Recreation

Concern: Meet the maximum modification VQO. Approximately 4 acres in Setting A and 6 acres in Setting B of this unit would be visible as background from Icy Strait (KVA 4).

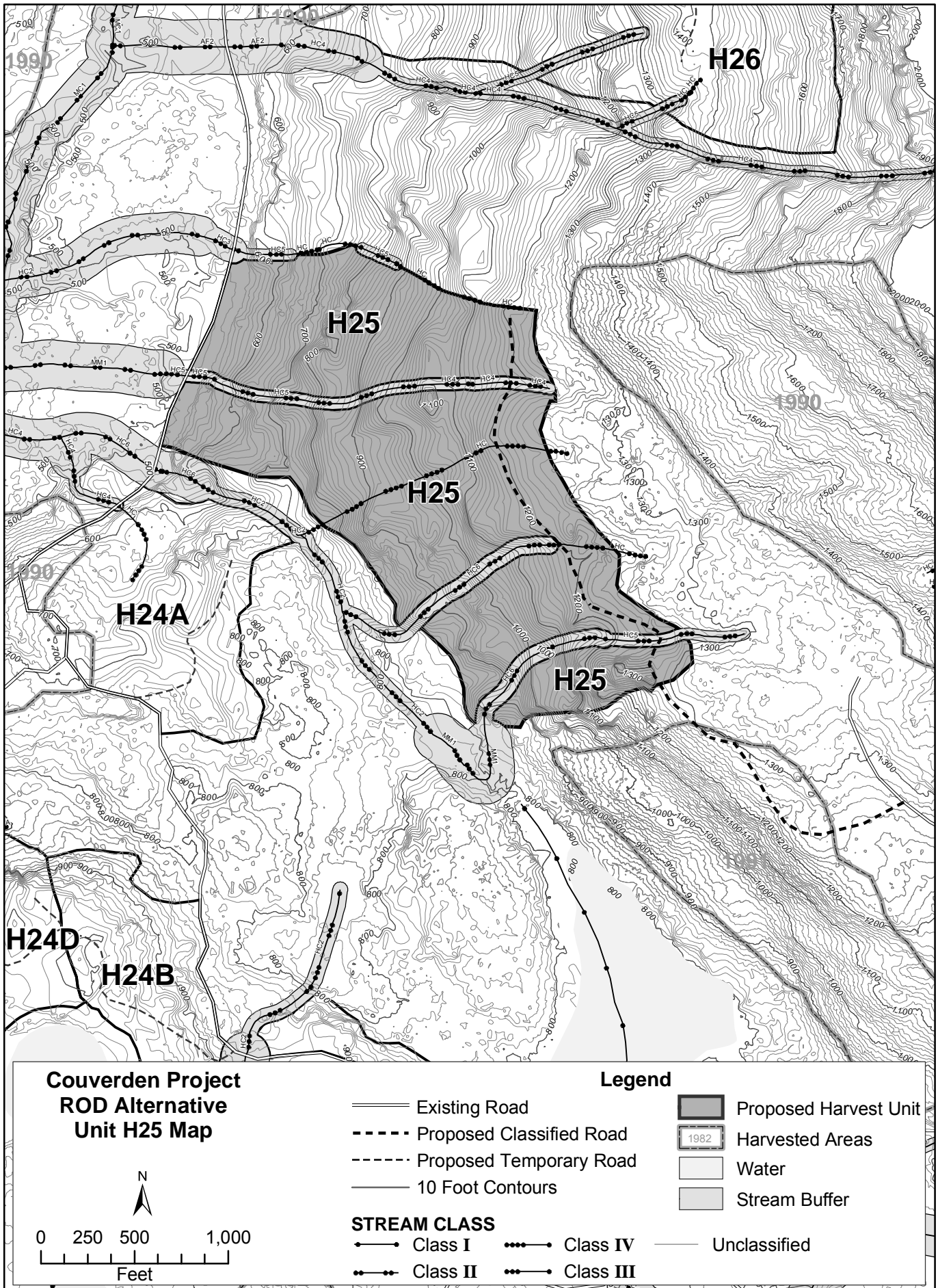
Mitigation: V1. Reserve trees would be concentrated in visible areas and steep areas to reduce visual contrast. V7. Leave most non-merchantable trees to help reduce visual contrast. Concentrate trees in the northern-central portion of Setting B and the southeast and northeast portion of Setting A.

Other Resources/Issues

Concern: None

Mitigation:

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COUVERDEN TIMBER SALE(S) - UNIT CARD Unit No. H25

ROD Alternative

Harvest Method: Short skyline

Total Acres: 77

Total Volume: 2,599 MBF

Volume per Acre: 38 MBF

UNIT DEVELOPMENT

Unit designed to meet VQO of maximum modification. Unit boundaries are based on Alternative 3; however, boundaries were extended to include unroaded and SEIS roadless areas but do not include Inventoried Roadless Areas covered by the Roadless Rule. The following mitigation measures were either taken into account during unit design, or they will be applied during project implementation: F1, F2, F3, F14, W1, W7, T1, V1, V7, and V8.

Logging and Transportation: Setting A and F would be harvested downhill to Road 8553 using the road as a continuous landing. Settings B to E would be accessed with a classified road constructed from Road 85532 and split yarded away from streams. Landings are located between each Class III stream to allow for split yarding. Tail holds are available within unit but, if needed, holds in H24 Setting A can be used. Blowdown was found; windthrow may be a problem along the east boundary after harvest.

Classified Roads: A 0.61 mile of classified road will be built to access the southern portion of the unit. Except for 0.8 mile of the 8550 road, existing roads will remain open and will be available for OHV use. New roads constructed for this project will be placed in a storage condition after use. Roads in storage are not considered usable by normal vehicle traffic.

Temporary Roads: No temporary roads will be needed.

Stand Management Objectives: The new stand will be primarily even-aged but will retain a component of the original stand through the rotation.

Treatment: Even-age management: clearcut with reserve trees. Clearcut Settings A, B, south half of C, and all of F. Clearcuts will follow the same prescription as Alternative 2. Reserve trees, snags, and non-merchantable trees distribute to minimize visual impacts and along streams. See the Visual/Recreation section. Stream buffers at a minimum should consist of a 50- to 100-foot feathered-edge that will improve windfirmness. Leave additional reserve area to the south of the Class III/IV stream at the north end of the unit. This prescription would optimize the regeneration potential for fiber production (especially for spruce), reduce mistletoe and windthrow, and would be the most economical harvest method. The prescription is appropriate to meet wildlife, watershed, and other resource objectives.

Regeneration Method: T1. Natural regeneration. The new stand is likely to be mostly hemlock.

Possible Future Treatments: Possible planting if natural regeneration does not result in fully stocked stand or to increase species diversity, release, and pre-commercial thinning. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old-growth trees in original harvest, plus enough large second-growth trees to meet the 10% reserve requirement.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: The unit is bisected by four streams and bordered by two. This includes one Class II segment, five Class III segments, and three Class IV segments. The Class II stream borders the southwest corner of the unit. Electrofishing of this stream determined that Dolly Varden were present only below a barrier 150 feet east of the road. The stream continues as a Class III upstream from the barrier and enters the unit, traversing the south upslope area. It contains beaver ponds just outside of the southwest portion of the unit. This stream is in a substantial V-notch in the south portion of the unit. A Class III stream bisects northwest portion of the unit and a stream along the north boundary contains Class III and IV segments. The two northern most streams become Class II streams within 100 to 300 feet of the unit based on reduced channel gradient below the road and proximity to known Class II streams.

Mitigation: F1. Class II stream segment: no commercial harvest within 100 feet of Class II channel or within the top of V-notch, whichever is greater. Manage the area beyond (approximately one site-potential tree height, about 120 feet) for reasonable assurance of windfirmness. Due to the close proximity of fish habitat of all the Class III channels, allow no programmed harvest within the V-notch or the sideslope break of Class III channels. Manage the area beyond (approximately one site-potential tree height, about 120 feet) for reasonable assurance of windfirmness. Provide buffer protection of the beaver ponds in the southwest portion of the unit. Ensure adequate deflection to avoid disturbance to riparian vegetation on these streams if yarding occurs across these stream channels. F2, F3. The four Class IV segments require directional felling, splitline, partial, or full suspension for the Class IV channels present within the unit.

Record of Decision

Soils/Wetlands/Karst

Concern: There are almost three acres of slopes >67% in the unit, and slopes in the central portion may exceed 72% in small areas. Several Class III and IV streams drain this unit and are tributary to a Class II stream.

Mitigation: F1. Maintain stream and windfirm buffer (BMP 12.6(a), 13.16) to protect Class III streams. F14. Avoid harvest on slopes > 72% and unstable slopes (BMP 13.5).

Wildlife

Concern: Medium- and high-value marten habitat and medium deer habitat was identified. Wildlife travel corridors were documented in the western portion of unit. Moose, black bear, and porcupine signs were recorded in the western half of the unit.

Mitigation: W1, W7. Leave live reserve trees, large culls, and snags where possible to maintain habitat structure wildlife trails and snag density throughout. Leave trees around large culls and snags to ensure windfirmness, especially along the western portion of unit.

Visual/Recreation

Concern: Meet VQO of maximum modification. Approximately 50 acres of the harvested unit will be visible as background from Icy Strait (KVA 4).

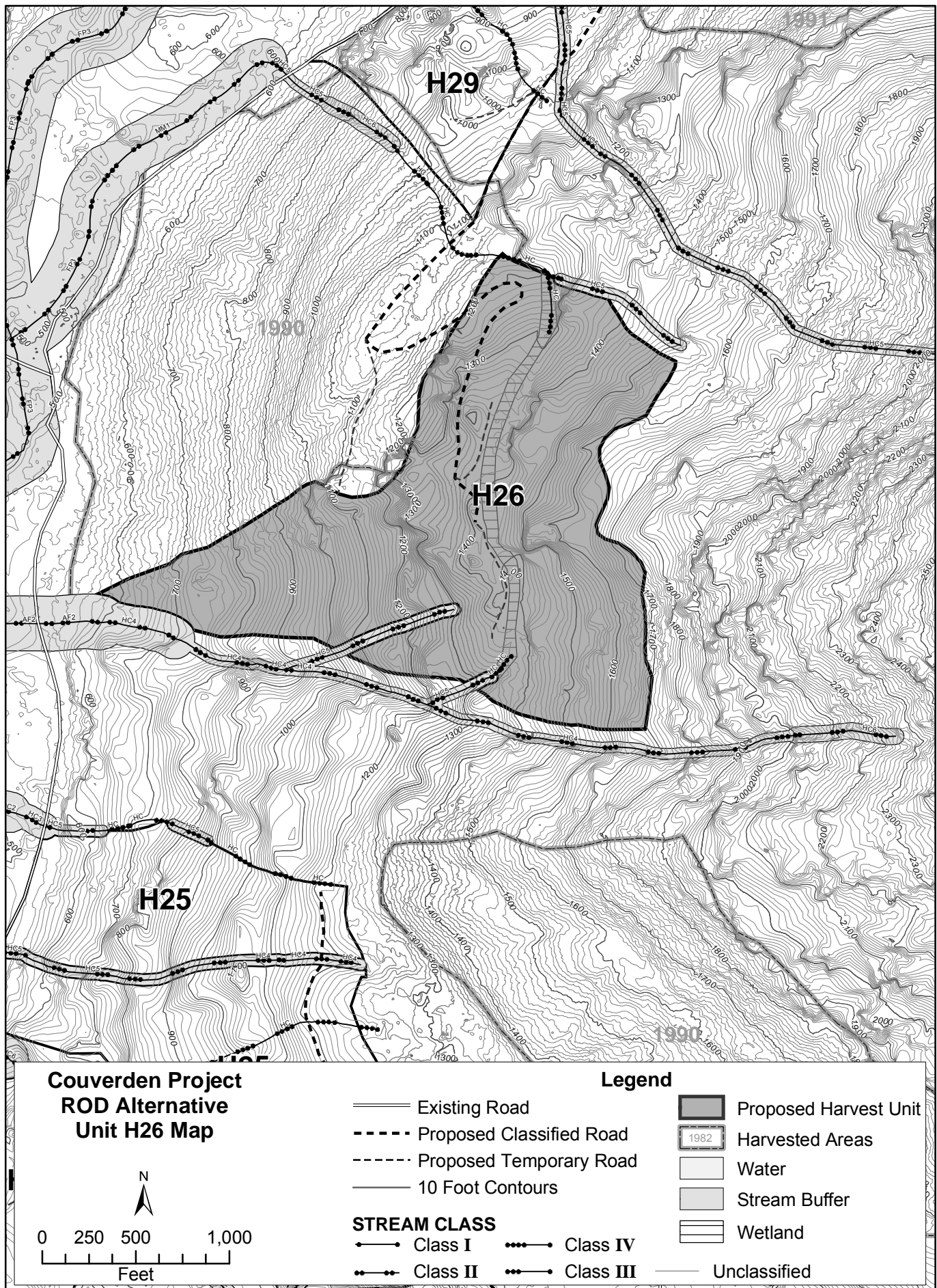
Mitigation: V1. Reserve trees would be concentrated in visible areas and steep areas to reduce visual contrast. V7. Leave most non-merchantable trees to help reduce visual contrast. V8. Feather southeast and northeast boundaries to reduce visual contrast. A muskeg near this unit creates a natural feathered-edge.

Other Resources/Issues

Concern: None

Mitigation:

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COUVERDEN TIMBER SALE(S) - UNIT CARD Unit No. H26

ROD Alternative

Harvest Method: Short Skyline & Long Skyline

Total Acres: 81

Total Volume: 2,058 MBF

Volume per Acre: 28 MBF

UNIT DEVELOPMENT

Unit designed to meet VQO of maximum modification. Unit boundaries are based on Alternative 3; however, boundaries were extended to include unroaded and SEIS roadless areas but do not include Inventoried Roadless Areas covered by the Roadless Rule. The following mitigation measures were either taken into account during unit design, or they will be applied during project implementation: F1, F2, F3, F10, F14, W1, W7, T1, V1, V7, and V8.

Logging and Transportation: The timber can be yarded using a short skyline and long skyline systems. Settings A, D, E, and F are long skyline systems. Setting A is on flat knob. North half of guyline circle has been logged. Will need to place either deadmen anchors or use machine anchors down ridgeline. Guyline extensions also required. Tail holds may be on other side of existing road at bottom of setting. Tail trees with tail holds in Class III stream buffer are required along south boundary. Tail trees required in Settings D, E, and F. Some shovel logging is possible along benches adjacent to landings. Setting F will have tail holds in Class III stream buffer. Settings B and C will be short skyline system with some area of shovel logging in the flat area along the west boundary. Tail trees are required, especially along upper setting boundary of Setting B. The Class III/IV stream along the northern boundary and the Class II stream along the southern boundary will require directional felling away from slope break buffer (BMP 12.6(a), 13.16). The Class IV and non-streams within the unit will be partial suspended. Windthrow is not expected to be a problem after harvest.

Classified Roads: A 0.42 mile classified road will be needed to access the unit. Except for 0.8 mile of the 8550 road, existing roads will remain open and will be available for OHV use. New roads constructed for this project will be placed in a storage condition after use. Roads in storage are not considered usable by normal vehicle traffic.

Temporary Roads: A 0.24 mile of temporary road will be needed to access the unit. The temporary road will be obliterated after use.

Stand Management Objectives: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Treatment: Clearcut with reserve trees. Reserve trees, snags, and non-merchantable trees distribute to minimize visual impacts (concentrate along east boundary). See the Visual/Recreation section. This prescription would optimize the regeneration potential for fiber production (especially for spruce), reduce mistletoe, and would be the most economical harvest method. The prescription is appropriate to meet wildlife, watershed, and other resource objectives.

Regeneration Method: T1. Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

Possible Future Treatments: Possible planting if natural regeneration does not result in fully stocked stand or to increase species diversity, release, and pre-commercial thinning. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old-growth trees in original harvest, plus enough large second-growth trees to meet the 10% reserve requirement.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concerns: One stream borders the unit to the south. It is a Class II in the lower region and a Class III above a fish barrier near the southwestern corner of the unit. Two other streams exit the unit to the south; one is a Class III and the other is a Class IV within the unit that changes to a Class III near the unit boundary. The north unit area is bounded by a Class III/IV channel that also has a Class IV tributary exiting the unit to the north. These all enter a Class IV channel well upstream (over 1,500 feet) from fish habitat.

Mitigation: F1. Along the Class II section, no commercial harvest within 100 feet of Class II channel or to the top of V-notch, whichever is greater. Manage the area beyond (approximately one site-potential tree height, about 120 feet) for reasonable assurance of windfirmness. Along the three Class III segments, no programmed harvest within V-notch or to the sideslope breaks of the channel, whichever is greater. Manage the area beyond (approximately one site-potential tree height, about 120 feet) for reasonable assurance of windfirmness. F2, F3. The two Class IV channels may require directional felling, splitline, partial, or full suspension for Class IV channels present within the unit.

Record of Decision

Soils/Wetlands/Karst

Concern: There is one landslide within 0.5 mile of the unit. There are 1.2 acres of >72% slopes on the eastside of the unit, as well as 1.0 acre of MMI 3 soil. There are 11.6 acres of slopes >55% throughout the unit. The proposed temporary road crosses slopes of 65% for approximately 50 feet. A sliver of forested wetland is in the east half of the unit. Partial suspension or debris mats should be available to reduce impact to this area.

Mitigation: F14. Avoid harvest on slopes >72% and unstable slopes (including MMI 3 soil) (BMP 13.5). Ensure road is placed on stable portion of slope and avoid slopes >67% where feasible (BMP 14.2, 14.7). F10. Route roads to minimize impacts to wetlands.

Wildlife

Concern: Medium-value marten and deer habitat was identified in the western corner of the unit. A small amount of high-structure habitat was also identified in this area.

Mitigation: W1, W7. Leave live reserve trees, large culls, and snags where possible to maintain habitat structure and snag density. Concentrate leave trees around large culls and snags to ensure windfirmness, or consider the west corner of the unit as a leave area.

Visual/Recreation

Concern: Meet the maximum modification VQO. Approximately 53 acres of the harvested unit would be visible as background from Icy Strait (KVA 4).

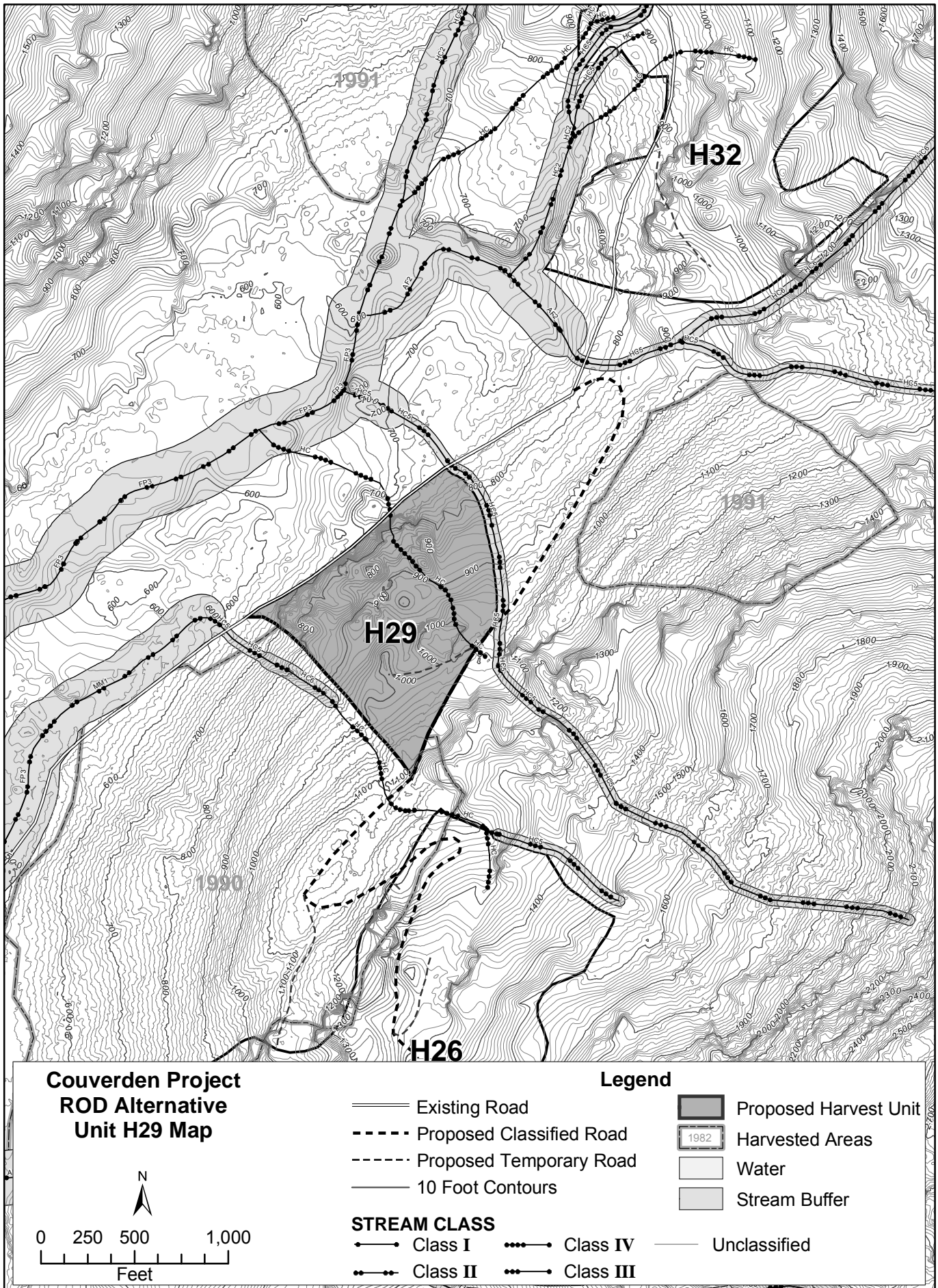
Mitigation: V1. Reserve trees would be concentrated in visible areas and steep areas to reduce visual contrast. V7. Leave most non-merchantable trees to help reduce visual contrast. V8. The southeastern and northeastern edges of the unit would be feathered to minimize visual impact.

Other Resources/Issues

Concern: None

Mitigation:

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COUVERDEN TIMBER SALE(S) - UNIT CARD Unit No. H29

ROD Alternative

Harvest Method: Short skyline

Total Acres: 24

Total Volume: 582 MBF

Volume per Acre: 27 MBF

UNIT DEVELOPMENT

Unit designed to meet VQO of maximum modification. Unit boundaries are based on Alternative 3. The following mitigation measures were either taken into account during unit design, or they will be applied during project implementation: F1, F2, F3, F14, T1, W1, W7, V1, and V7.

Logging and Transportation: The timber can be yarded using a short skyline system. There are three settings within the unit. Setting A is downhill yarding to the exiting Road 8561. Guyline anchors are out of the unit. Setting B is uphill yarding to a landing located just off the existing temporary road. Guyline extensions maybe required. Setting C is both uphill and downhill yarding from point landing at the end of the temporary spur. All three setting tail trees are required. Class III stream, along the northeastern boundary, will require directional felling away from slope break buffer (BMP 12.6(a), 13.16). The Class IV stream within the unit will be split yarded and partial suspension can be achieved. Windthrow is not expected to be a problem after harvest. Southeast half of unit is visible from saltwater.

Classified Roads: Approximately 0.3 mile of classified road will be needed to access the unit. It will follow the route of a former temporary road that begins at Road 8561. Except for 0.8 mile of the 8550 road, existing roads will remain open and will be available for OHV use. New roads constructed for this project will be placed in a storage condition after use. Roads in storage are not considered usable by normal vehicle traffic.

Temporary Roads: Less than 0.1 mile of temporary road needed within the unit under Alternatives 2 and 3 (approximately 0.4 mile under Alternatives 4 and 6). The temporary road will be obliterated after use.

Stand Management Objectives: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Treatment: Clearcut with reserve trees. Feather reserve trees along Class III stream to provide a windfirm buffer. This prescription would optimize the regeneration potential for fiber production (especially for spruce), reduce mistletoe, and would be the most economical harvest method. The prescription is appropriate to meet wildlife, watershed, and other resource objectives

Regeneration Method: T1. Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

Possible Future Treatments: Possible planting if natural regeneration does not result in fully stocked stand or to increase species diversity, release, and pre-commercial thinning. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old-growth trees in original harvest, plus enough large second-growth trees to meet the 10% reserve requirement.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: The unit is bordered to the northeast by a Class III stream and bisected by a Class IV stream. A Class III/IV stream lies about 150 feet south of the unit in a clear cut. Based on electrofishing, the northeast stream contains Dolly Varden about 500 feet downstream of the unit. The south stream, based on visual observations, also has fish about 300 feet from the unit. The northeast stream has steep sideslopes (80%) near the unit bottom that could become unstable if disturbed.

Mitigation: F1. The Class III stream should have no programmed harvest within V-notch or to the sideslope break of the channel, whichever is greater. Manage the area beyond (approximately one site-potential tree height, about 120 feet) for reasonable assurance of windfirmness. F2, F3. The Class IV channel within the unit may require directional felling, splitline, partial, or full suspension.

Soils/Wetlands/Karst

Concern: There is one landslide within 0.5 mile of the unit. There are 3.5 acres of >55% slopes.

Mitigation: F14. Avoid harvest on unstable slopes (BMP 13.5).

Record of Decision

Wildlife

Concern: Medium- and high-value marten habitat was identified in north end of unit. Black bear was visually observed in unit. Class III streams frame this unit.

Mitigation: W1, W7. Leave live reserve trees, large culls, and snags where possible to maintain habitat structure and snag density throughout, especially along streams on the north and west boundaries. Concentrate leave trees around large culls and snags to ensure windfirmness.

Visual/Recreation

Concern: Meet the maximum modification VQO. Approximately 1 acre of the harvested unit would be visible as background from the LTF (KVA 3).

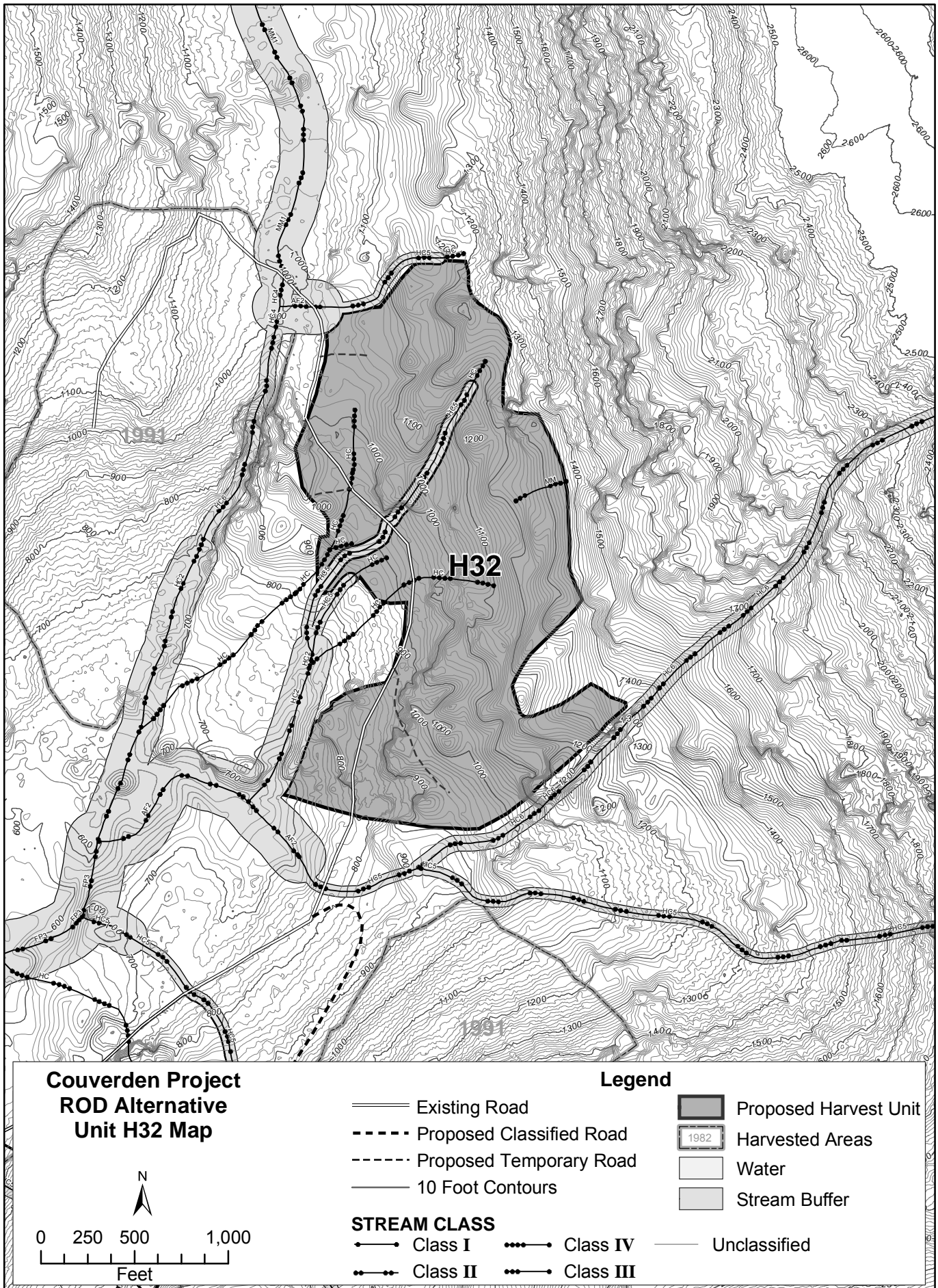
Mitigation: V1. Reserve trees would be concentrated in visible areas and steep areas to reduce visual contrast. V7. Leave most non-merchantable trees to help reduce visual contrast.

Other Resources/Issues

Concern: None

Mitigation:

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COUVERDEN TIMBER SALE(S) - UNIT CARD Unit No. H32

ROD Alternative

Harvest Method: Long Skyline

Total Acres: 73

Total Volume: 3,394 MBF

Volume per Acre: 51 MBF

UNIT DEVELOPMENT

Unit designed to meet VQO of maximum modification. Unit boundaries are based on Alternative 3. The following mitigation measures were either taken into account during unit design, or they will be applied during project implementation: F1, F2, F3, F14, T1, W1, W7, and T1.

Logging and Transportation: The unit will be yarded using long skyline system. There are five settings within the unit; all settings require tail trees. Setting B and C can use short skyline if desired. Tail holds will be out of the unit, sometimes across alder areas at top of unit. Tail holds will be in stream buffers for Settings A, B, and D. Some side-blocking and slack pulling will be needed to laterally yard away from Class III stream on west side of Setting C and away from buffer on the Class III stream on southeast boundary of Setting E. Class III streams along the northern southern boundaries and in the middle of the unit will require directional felling away from slope break buffer (BMP 12.6(a), 13.16). Partial suspension across Class IV stream is needed. Blowdown was found; windthrow may be a concern along the southeast boundary after harvest.

Classified Roads: No new classified roads will be needed to access the unit. Except for 0.8 mile of the 8550 road, existing roads will remain open and would be available for OHV use.

Temporary Roads: Three short temporary roads will be needed. The southern road is 0.15 mile long and ends at a large landing; the west road is 0.06 mile long; and the northern road is 0.05 mile long, ending at a large landing. The temporary roads will be obliterated after use.

Stand Management Objectives: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Treatment: Clearcut with reserve trees. Reserve trees left in addition to stream buffers should form a 50- to 100-foot feathered-edge to improve windfirmness. This prescription would optimize the regeneration potential for fiber production (especially for spruce), reduce mistletoe and windthrow, and would be the most economical harvest method. The prescription is appropriate to meet wildlife, watershed, and other resource objectives.

Regeneration Method: T1. Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

Possible Future Treatments: Possible planting if natural regeneration does not result in fully stocked stand or to increase species diversity, release, and pre-commercial thinning. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old-growth trees in original harvest, plus enough large second-growth trees to meet the 10% reserve requirement.

RESOURCE CONCERNS & MITIGATION

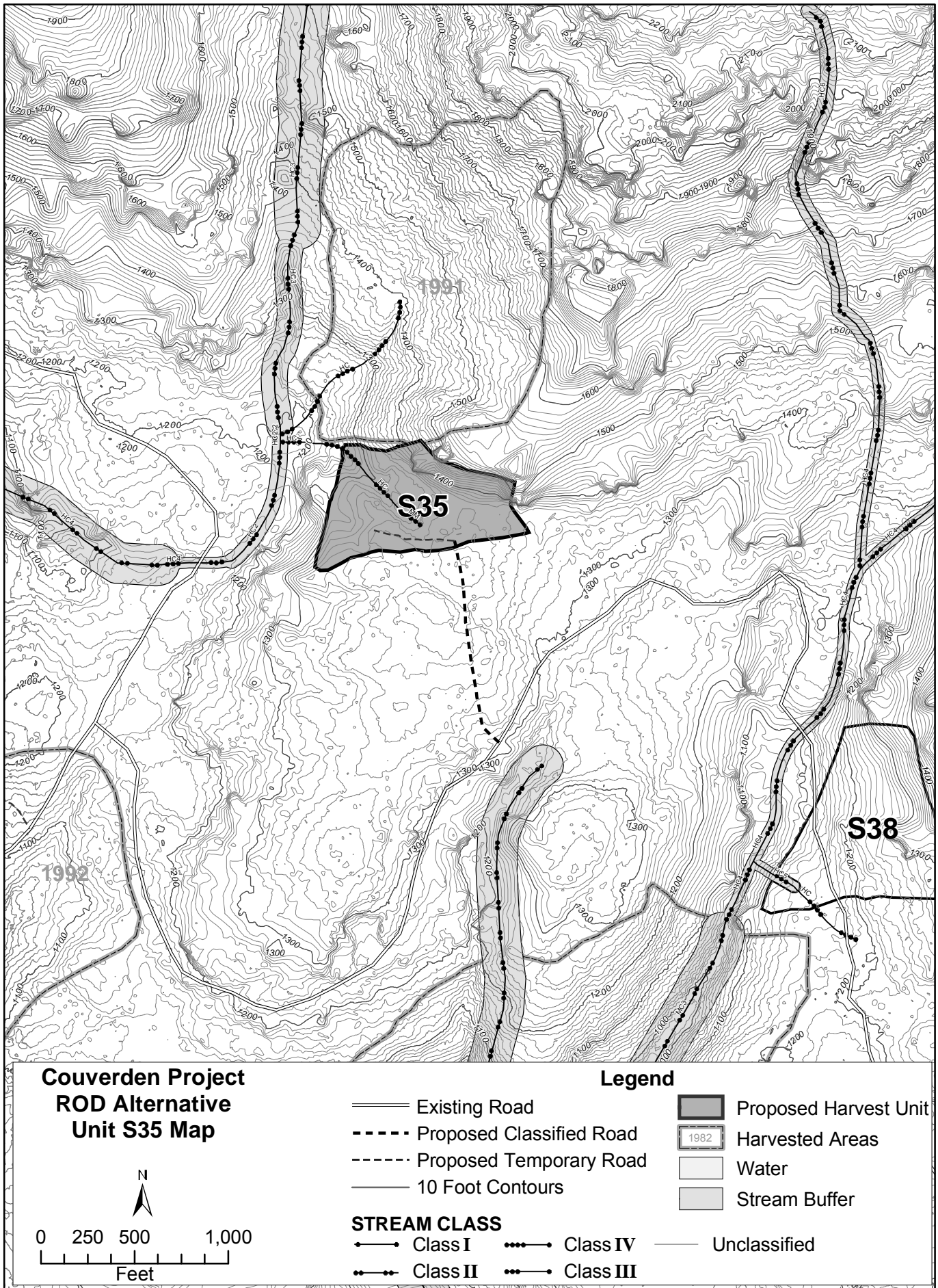
Watershed/Fisheries

Concern: The unit is bounded by streams on the north, southwest, and southeast, and there are six streams within the unit. The unit area includes three Class II, six Class III, and six Class IV reaches. All Class II segments are outside of the unit. A large stream west of the unit changes from a Class II to Class III above at a series of large (12- to 35-foot) falls in the middle area that block upstream fish passage. This stream has very steep banks (70 to 110%) that range up to about 200- to 400-foot slope length, extending toward the unit boundary. There are signs of slides along this bank, including at the top of slope break in the southwest portion of the unit. Past logging across the stream from this unit has contributed large amount of logs to the stream, which have the potential to cause jams further downstream. The Class II alluvial fan stream to the south extends to the southwest unit corner before a falls limits upstream fish passage. One small Class II stream extends to approximately 120 feet of the south-central unit boundary before changing to several branches of Class III and IV channels. The Class III channels include a portion of the large stream to the west, portions of two streams in the middle of the unit, one along the north boundary, and one to the south, which in places is in a highly incised V-notch along the unit boundary. The six Class IV segments are in the eastern upper slope portion, in the west, and southwest portions of the unit.

Record of Decision

<p><u>Mitigation:</u> F1. The Class III portion of the large Class II/III stream on the west boundary: ensure no programmed harvest within the V-notch or to the sideslope break of Class III channel, whichever is greater. Manage the area beyond (approximately one site-potential tree height, about 120 feet) for reasonable assurance of windfirmness. Provide an additional buffer of 50 feet near the slide area near the west/southwest unit corner. For the small area of Class II stream adjacent to the unit, in addition to the protections noted, allow no commercial harvest within 100 feet of the channel. For the Class II alluvial fan channel in the south, allow no commercial harvest within 100 feet of the channel. No programmed commercial harvest within the active portion of the alluvial fan or 140 feet (the height of one site-potential tree), whichever is greater. Take no more than 10% of the remaining trees within the fan, leaving large trees for future stream channel recruitment. For the high gradient Class II channel in the south-central area, allow no commercial harvest within 100 feet of Class II channel or the top of V-notch, whichever is greater. Manage the area beyond (approximately one site-potential tree height, about 120 feet) for reasonable assurance of windfirmness. For the high gradient Class III channels, allow no programmed harvest within the V-notch or to the sideslope break of Class III channel, whichever is greater. Manage the area beyond (approximately one site-potential tree height, about 120 feet) for reasonable assurance of windfirmness. Also, the lower portion of the north alluvial fan channel should have no programmed harvest within 140 feet (one site-potential tree height) or active portion of the fan, whichever is greater. Take no more than 10% of the remaining trees within the fan, leaving large trees for future stream channel recruitment. F2, F3. The six Class IV channels within the unit may require directional felling, splitline, partial, or full suspension.</p>
<p><u>Soils/Wetlands/Karst</u></p> <p><u>Concern:</u> There are landslides along the river to the west of the unit. There is 0.8 acre of slopes >72% along northeast and southeastern edge of unit. There are 13.4 acres of slopes >55% throughout the rest of the unit. There is 0.1 acre of MMI 4 soils and 1.5 acres of MMI 3 soils along the eastern edge of unit. Streams in unit are tributaries to Class II stream.</p> <p><u>Mitigation:</u> F14. Avoid harvest on slopes >72% and unstable slopes (including MMI 3 and MMI 4 soils) (BMP 13.5). F1. Maintain stream and windfirm buffer (BMP 12.6(a), 13.16) to protect Class II and III streams.</p>
<p><u>Wildlife</u></p> <p><u>Concern:</u> One of the higher elevation units. The southern tip of the unit contains medium-value marten habitat. Wildlife travel corridors were documented throughout the unit, with moose and black bear visually observed in the unit. Previous harvests to the west and south may have impacted dispersal/travel corridors between alpine and lower elevational habitat.</p> <p><u>Mitigation:</u> W1, W7. Leave live reserve trees, large culls, and snags where possible to maintain habitat structure and snag density. Concentrate leave trees around stream buffers, culls, and snags to ensure windfirmness.</p>
<p><u>Visual/Recreation</u></p> <p><u>Concern:</u> Meet the maximum modification VQO. No parts of the harvested unit would be visible from Visual Priority Routes and Use Areas or selected KVAs.</p> <p><u>Mitigation:</u> None</p>
<p><u>Other Resources/Issues</u></p> <p><u>Concern:</u> None</p> <p><u>Mitigation:</u></p>

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COUVERDEN TIMBER SALE(S) - UNIT CARD Unit No. S35

ROD Alternative

Harvest Method: Shovel & Short Skyline

Total Acres: 11

Total Volume: 243 MBF

Volume per Acre: 24 MBF

UNIT DEVELOPMENT

Unit designed to meet VQO of maximum modification. Unit boundaries are based on Alternative 3. The following mitigation measures were either taken into account during unit design, or they will be applied during project implementation: F2, F3, F14, T1, W6, W7, V1, and V7.

Logging and Transportation: The timber can be yarded using shovel and short skyline systems using the road as continuous roadside landings. This area contains some wet spots so puncheon will be needed and shovel roads will have to be laid-out around these areas. The area west of the main road can be yarded with a short skyline system. Tail holds are not plentiful and twistlers may be needed. Deadmen maybe needed for guyline anchors in the southwest corner of this unit. The Class IV stream within the unit will be split yarded (BMP 12.6(a), 13.16). Logs can be suspended across the stream. Minor blowdown observed in the unit; windthrow will not be a problem in this area after harvest. Unit is not visible from saltwater.

Classified Roads: No new classified roads will be needed. Except for 0.8 mile of the 8550 road, existing roads will remain open and would be available for OHV use.

Temporary Roads: Two temporary roads will be needed. The west road is 0.08 mile. The east road is 0.1 mile and ends at a large landing. The temporary roads will be obliterated after use.

Stand Management Objectives: The future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Treatment: Clearcut with reserve trees. Reserve trees, snags, and non-merchantable trees distribute throughout the unit. This prescription would optimize the regeneration potential for fiber production (especially for spruce), reduce mistletoe, and would be the most economical harvest method. The prescription is appropriate to meet wildlife, watershed, and other resource objectives.

Regeneration Method: T1. Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

Possible Future Treatments: Possible planting if natural regeneration does not result in fully stocked stand or to increase species diversity, release, and pre-commercial thinning. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old-growth trees in original harvest, plus enough large second-growth trees to meet the 10% reserve requirement.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: There is a Class III stream over 300 feet to the west of the unit (flagged as a Class II at top of slope break). Stream class was originally based on habitat. The 1999 culvert data indicated it was a Class II. Newer culvert data (2001) that included electrofishing, indicated it was Class III at the culvert downstream of unit. The steep slope below unit to the west could be unstable if disturbed. The upper slope to the north is also steep and could be unstable if disturbed. One small Class IV stream drains the western portion of the unit.

Mitigation: Ensure that the unit boundary remains upslope of the steep western region above the Class III stream to avoid water quality impacts from potential slides in steep areas. Consider lowering the upper unit boundary to exclude the high gradient, potentially unstable area from unit. F2, F3. The Class IV channel may require directional felling, splitline, partial, or full suspension within the unit.

Soils/Wetlands/Karst

Concern: This unit is within 0.5 mile of a landslide. There are steep slopes to the northeast of the unit, but there are no slopes >72%. There are 1.4 acres of slopes >55% within the unit.

Mitigation: F14. Avoid harvest on unstable slopes (BMP 13.5).

Record of Decision

Wildlife/TES Plants

Concern: Unit is scheduled for clearcutting.

Mitigation: W6, W7. Use clearcut with reserve system and retain non-merchantable trees and snags to maintain habitat diversity.

Visual/Recreation

Concern: Meet the maximum modification VQO. Approximately 3 acres of the harvested unit would be visible from Icy Strait.

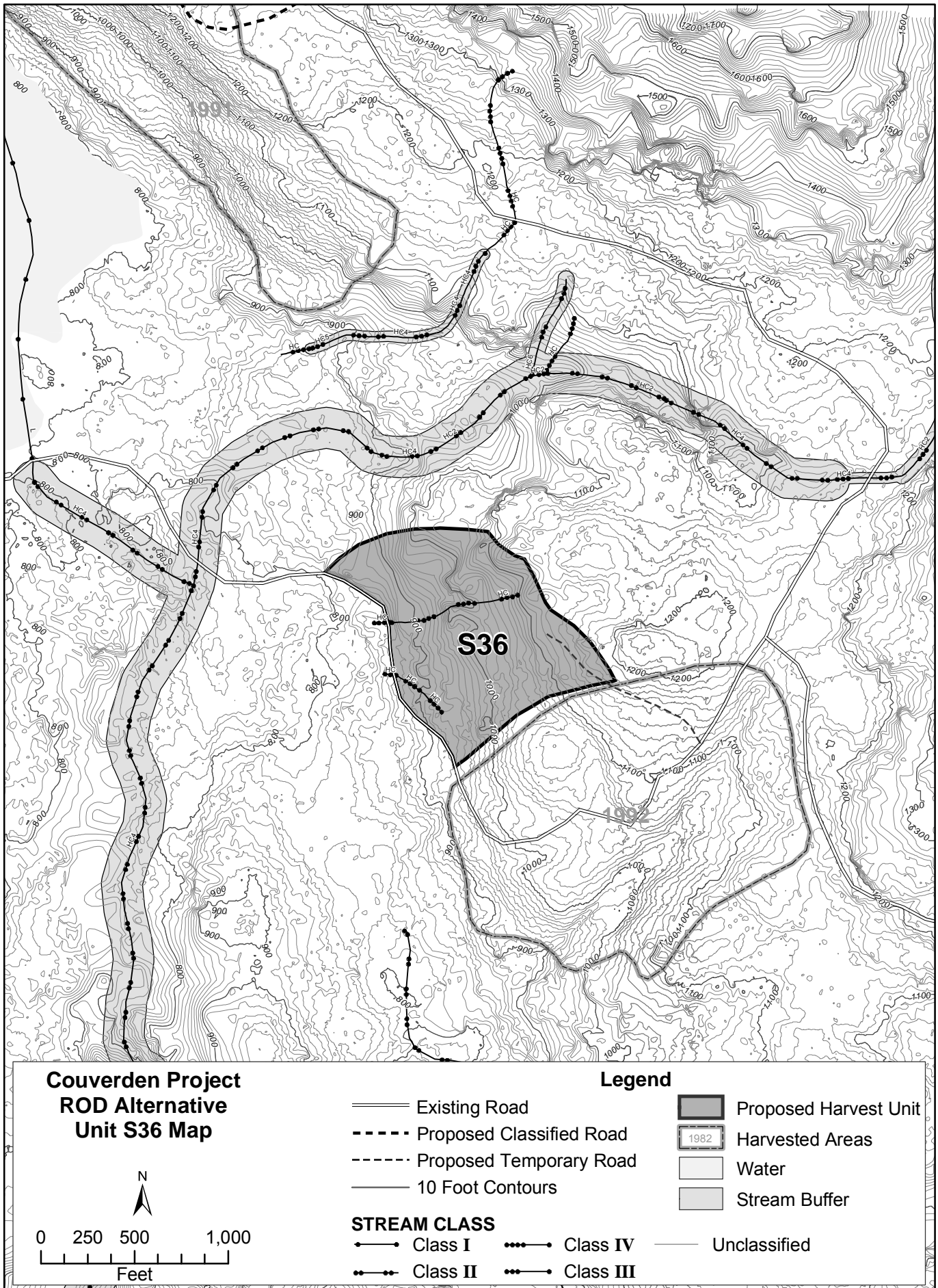
Mitigation: V1. Reserve trees would be concentrated in visible areas and steep areas to reduce visual contrast. V7. Leave most non-merchantable trees to help reduce visual contrast.

Other Resources/Issues

Concern: None

Mitigation:

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COUVERDEN TIMBER SALE(S) - UNIT CARD Unit No. S36

ROD Alternative

Harvest Method: Short Skyline

Total Acres: 23

Total Volume: 298 MBF

Volume per Acre: 14 MBF

UNIT DEVELOPMENT

Unit designed to meet VQO of maximum modification. Unit boundaries are based on Alternative 3. The following mitigation measures were either taken into account during unit design, or they will be applied during project implementation: F2, F3, F10, T1, W1, and W7.

Logging and Transportation: The unit can be yarded using short skyline systems using the existing road as continuous roadside landings. Setting A can be logged to the proposed landing on the temporary spur. Back guyline stumps for this landing are marginal and twistlers may have to be utilized. There are two Class IV streams in the unit. Yarding from the existing road will allow for not having to yard across streams. Windthrow is not expected to be a problem after harvest. Unit is not visible from saltwater.

Classified Roads: No new classified road will be needed. Except for 0.8 mile of the 8550 road, existing roads will remain open and would be available for OHV use.

Temporary Roads: Approximately 0.2 mile of temporary road will be needed. The temporary road will be obliterated after use.

Stand Management Objectives: The future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Treatment: Clearcut with reserve trees. Reserve trees should be vigorous spruce trees distributed throughout the unit. Stem rot was prolific throughout the hemlock species; selection of these trees for harvest would improve stand health. This prescription would optimize the regeneration potential for fiber production (especially for spruce), reduce mistletoe, and would be the most economical harvest method. The prescription is appropriate to meet wildlife, watershed, and other resource objectives.

Regeneration Method: T1. Natural regeneration. Majority of the stand is hemlock.

Possible Future Treatments: Possible planting if natural regeneration does not result in fully stocked stand or to increase species diversity, release, and pre-commercial thinning. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old-growth trees in original harvest, plus enough large second-growth trees to meet the 10% reserve requirement.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: There are two Class IV channels. One stream bisects most of the unit from east to west, and one is near the southeast boundary. No culvert data was available for these streams.

Mitigation: F2, F3. The two Class IV channels may require directional felling, splitline, partial, or full suspension within the unit.

Soils/Wetlands/Karst

Concern: The harvested area to the southwest contains a wetland.

Mitigation: F10. Route temporary road to avoid the wetland.

Wildlife

Concern: Wildlife travel corridors were documented in northwest corner of unit. Moose, black bear, and porcupine signs were observed.

Mitigation: W1, W7. Leave live reserve trees, large culls, and snags where possible to maintain habitat structure and snag density. Concentrate leave trees around stream buffer, culls, and snags to ensure windfirmness, especially in northwest corner of unit.

Visual/Recreation

Concern: Meet the maximum modification VQO. No part of the harvested unit would be visible from Visual Priority Routes and Use Areas or selected KVAs.

Mitigation: None

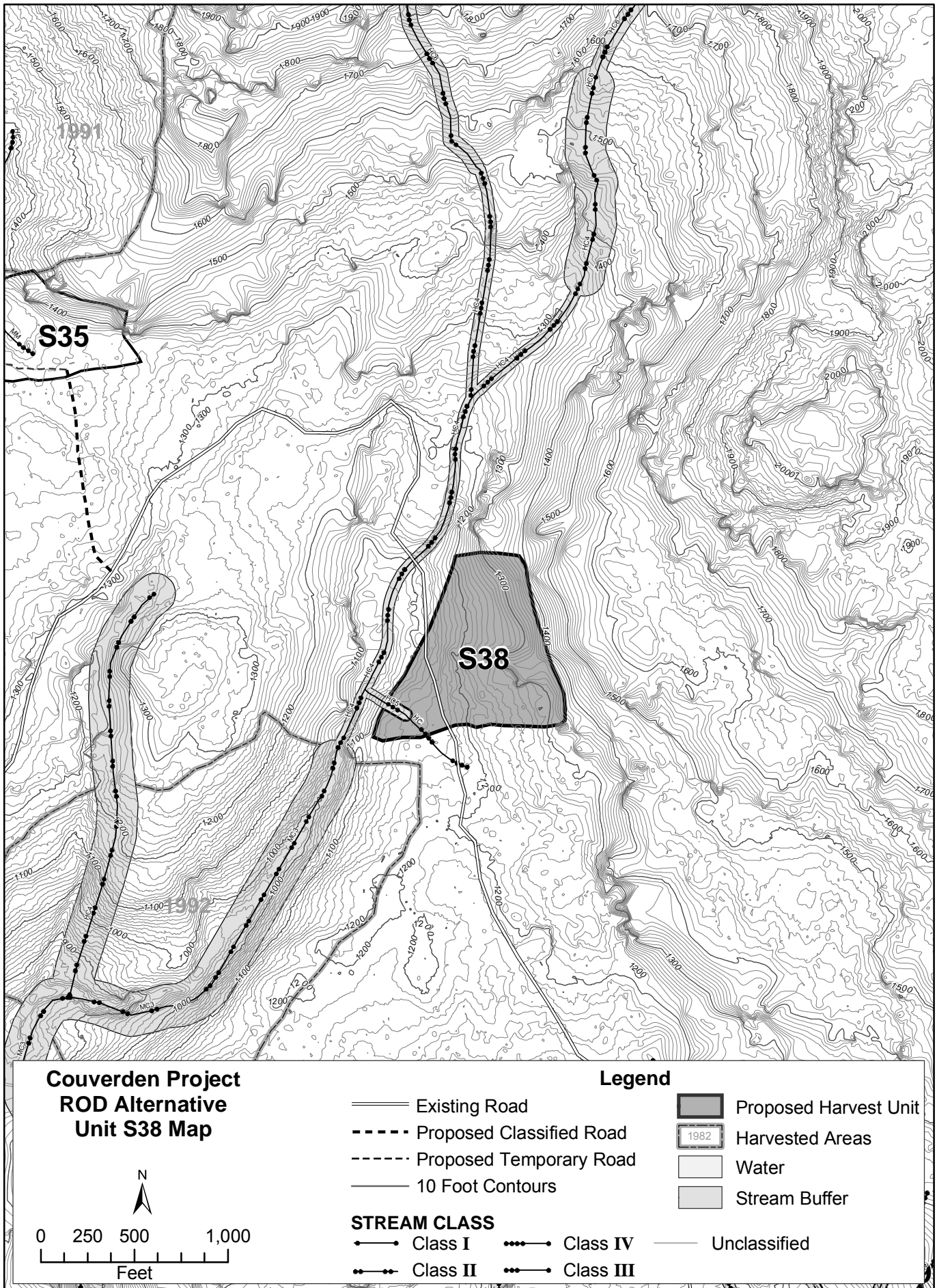
Record of Decision

Other Resources/Issues

Concern: None

Mitigation:

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COUVERDEN TIMBER SALE(S) - UNIT CARD Unit No. S38 ROD Alternative

Harvest Method: Short Skyline

Total Acres: 14

Total Volume: 475 MBF

Volume per Acre: 37 MBF

UNIT DEVELOPMENT

Unit designed to meet VQO of maximum modification. Unit boundaries are based on Alternative 3. The following mitigation measures were either taken into account during unit design, or they will be applied during project implementation: F1, F2, F3, F14, W6, W7, and T1.

Logging and Transportation: The unit can be yarded using a short skyline system using the existing road as continuous roadside landings. Some areas along the road do not have adequate run-out for landing logs, so logs will have to be swung to the side when landed. Tail holds will have to be on the steep slopes to provide adequate deflection. There is one Class IV stream in the unit. Logs can be suspended across stream. Blowdown was found; windthrow may be a problem along the eastern boundary on the steeper slopes after harvest. Part of the unit is visible from saltwater.

Classified Roads: No new classified roads will be needed. Except for 0.8 mile of the 8550 road, existing roads will remain open and would be available for OHV use.

Temporary Roads: No temporary roads will be needed.

Stand Management Objectives: The future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Treatment: Clearcut with reserve trees. Retention trees should be patched together at the north end of the unit feathered to the boundary. This prescription would optimize the regeneration potential for fiber production (especially for spruce), reduce mistletoe and windthrow, and would be the most economical harvest method. The prescription is appropriate to meet wildlife, watershed, and other resource objectives.

Regeneration Method: T1. Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

Possible Future Treatments: Possible planting if natural regeneration does not result in fully stocked stand or to increase species diversity, release, and pre-commercial thinning. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old-growth trees in original harvest, plus enough large second-growth trees to meet the 10% reserve requirement.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: A Class III stream lies between 120 and 240 feet west of the unit and a Class IV/III stream crosses the southwest portion of the unit. The steep area in the upper unit may become unstable if disturbed.

Mitigation: F1. The Class III stream should have no programmed harvest within the V-notch or to the sideslope break of Class III channel, whichever is greater. Manage the area beyond (approximately one site-potential tree height, about 120 feet) for reasonable assurance of windfirmness. F2, F3. The Class IV portion south stream may require directional felling, splitline, partial, or full suspension within the unit. Provide good suspension for removal of timber from the upper east high slope areas to avoid soil disturbance.

Soils/Wetlands/Karst

Concern: There is a landslide along a stream to the north of the unit. There are 2.2 acres of slopes >55% within the unit.

Mitigation: F14. Avoid harvest on unstable slopes (BMP 13.5).

Wildlife

Concern: Unit is scheduled for clearcutting.

Mitigation: W6, W7. Use clearcut with reserves system and retain nonmerchantable trees and snags to maintain habitat diversity.

Record of Decision

Visual/Recreation

Concern: Meet the maximum modification VQO. Approximately 0.5 acre of the harvested unit would be visible from Icy Strait.

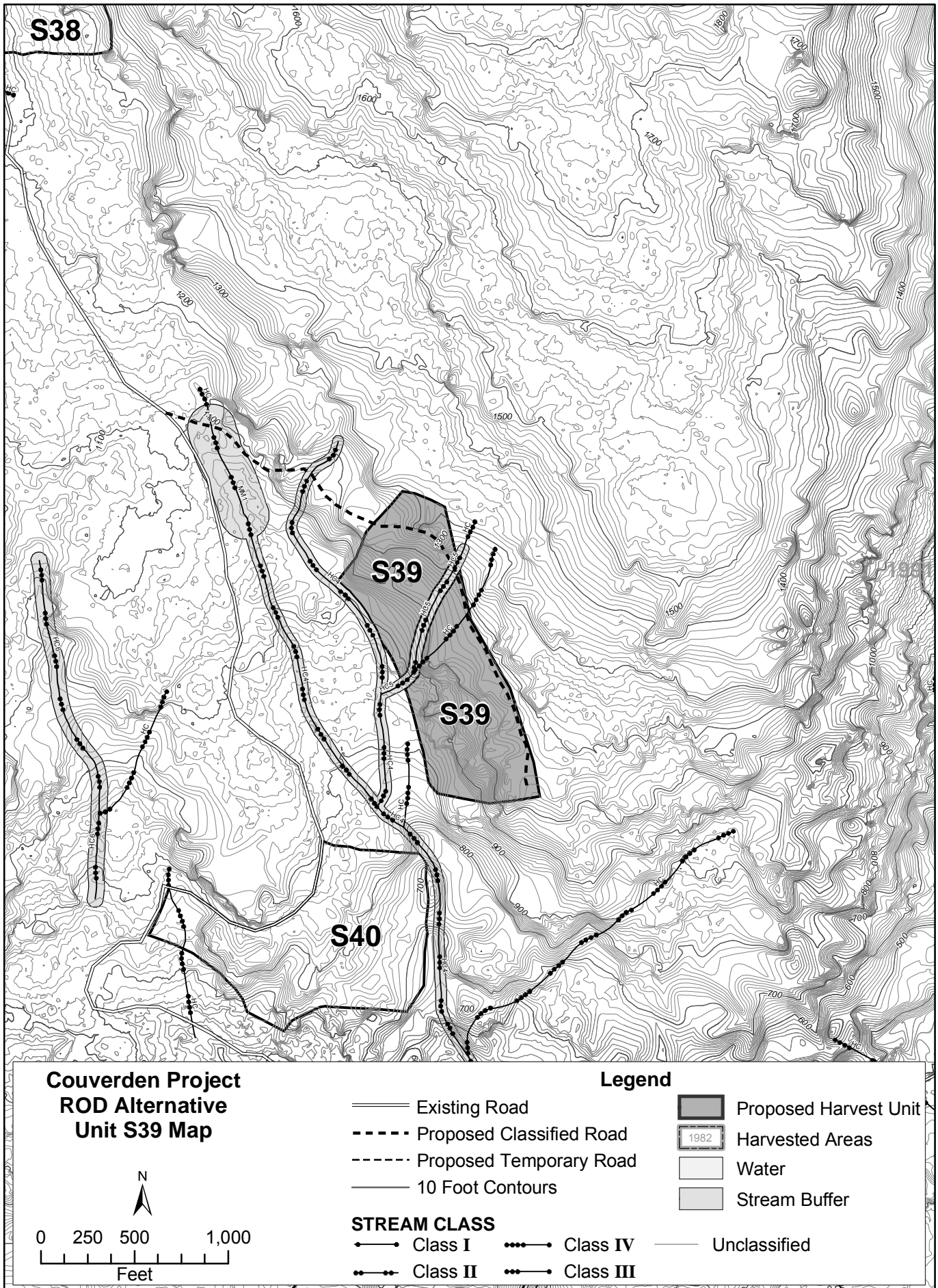
Mitigation: None

Other Resources/Issues

Concern: None

Mitigation:

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COUVERDEN TIMBER SALE(S) - UNIT CARD Unit No. S39

ROD Alternative

Harvest Method: Short skyline

Total Acres: 19

Total Volume: 527 MBF

Volume per Acre: 31 MBF

UNIT DEVELOPMENT

Unit designed to meet VQO of partial retention. Unit boundaries are based on Alternative 3. The following mitigation measures were either taken into account during unit design, or they will be applied during project implementation: F1, F2, F3, F14, T1, W6, W7, V6, V7, and V8.

Logging and Transportation: The timber can be yarded using a short skyline system using the planned classified road as a continuous roadside landing. A mobile tailhold will be needed along Road 8553. Class III stream, along the southern boundary and inside the unit, will require directional felling away from slope break buffer (BMP 12.6(a), 13.16). All streams can be split yarded. Windthrow is not expected to be a problem after harvest. The upper one-half of the unit is visible from saltwater.

Classified Roads: Approximately 0.6 mile of new classified road will be needed to access the unit. Except for 0.8 mile of the 8550 road, existing roads will remain open and will be available for OHV use. New roads constructed for this project will be placed in a storage condition after use. Roads in storage are not considered usable by normal vehicle traffic.

Temporary Roads: No temporary road will be needed.

Stand Management Objectives: The future stand will be two-aged, tending towards uneven-age over time with a mix of large- and medium-size trees and seedlings and saplings.

Treatment: Clearcut with reserve trees. Reserve trees, snags, and non-merchantable trees should be distributed as to minimize visual impacts, especially in the upper part of the unit visible from the salt water. This prescription would optimize the regeneration potential for fiber production (especially for spruce), reduce mistletoe, and would be the most economical harvest method. The prescription is appropriate to meet wildlife, watershed, and other resource objectives.

Regeneration Method: T1. Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

Possible Future Treatments: Possible planting if natural regeneration does not result in fully stocked stand or to increase species diversity; no release or pre-commercial thinning expected. Similar harvests every 50 to 60 years. Future entries will maintain a minimum of 10% by volume of the stand in mature trees and 20% retention trees.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: There are two Class III stream segments present; one segment is a partial unit boundary to the northwest and another is passing through most of unit central area. The west boundary stream is a steep V-notch (90% slope) with potential for slope disturbance if not buffered, while slopes of central stream are more moderate (70%). There is a Class IV stream in the central portion of the unit, and, in the upper portion of the unit, the Class III changes to a Class IV above the proposed road crossing. Electrofishing confirmed cutthroat trout and Dolly Varden habitat is more than 3,000 feet downstream.

Mitigation: F1. The two Class III streams should have no programmed harvest within V-notch or to the sideslope break of the channels, whichever is greater. Manage the area beyond (approximately one site-potential tree height, about 120 feet) for reasonable assurance of windfirmness. F2, F3. The two central area Class IV streams may require directional felling, splitline, partial, or full suspension for Class IV channels present within the unit.

Soils/Wetlands/Karst

Concern: This unit has 0.3 acre of slopes >72% and 4.2 acres of slopes >55%. There are about 13 acres of an SMU with 25% McGilvery soils on the northern end of the unit.

Mitigation: F14. Avoid harvest on slopes >72% and unstable slopes (BMP 13.5). Use skyline logging system on McGilvery soils (BMP 13.5). Avoid soil disturbance with heavy equipment and construction of landings on McGilvery soils (BMP 13.10).

Record of Decision

Wildlife

Concern: This unit is scheduled for clearcutting.

Mitigation: W6, W7. Use clearcut with reserves system and retain non-merchantable trees and snags to maintain habitat diversity.

Visual/Recreation

Concern: Meet the maximum modification VQO. Approximately 12 acres of the harvested unit would be visible from Icy Strait (KVA 4) and the private recreation cabin (KVA 5).

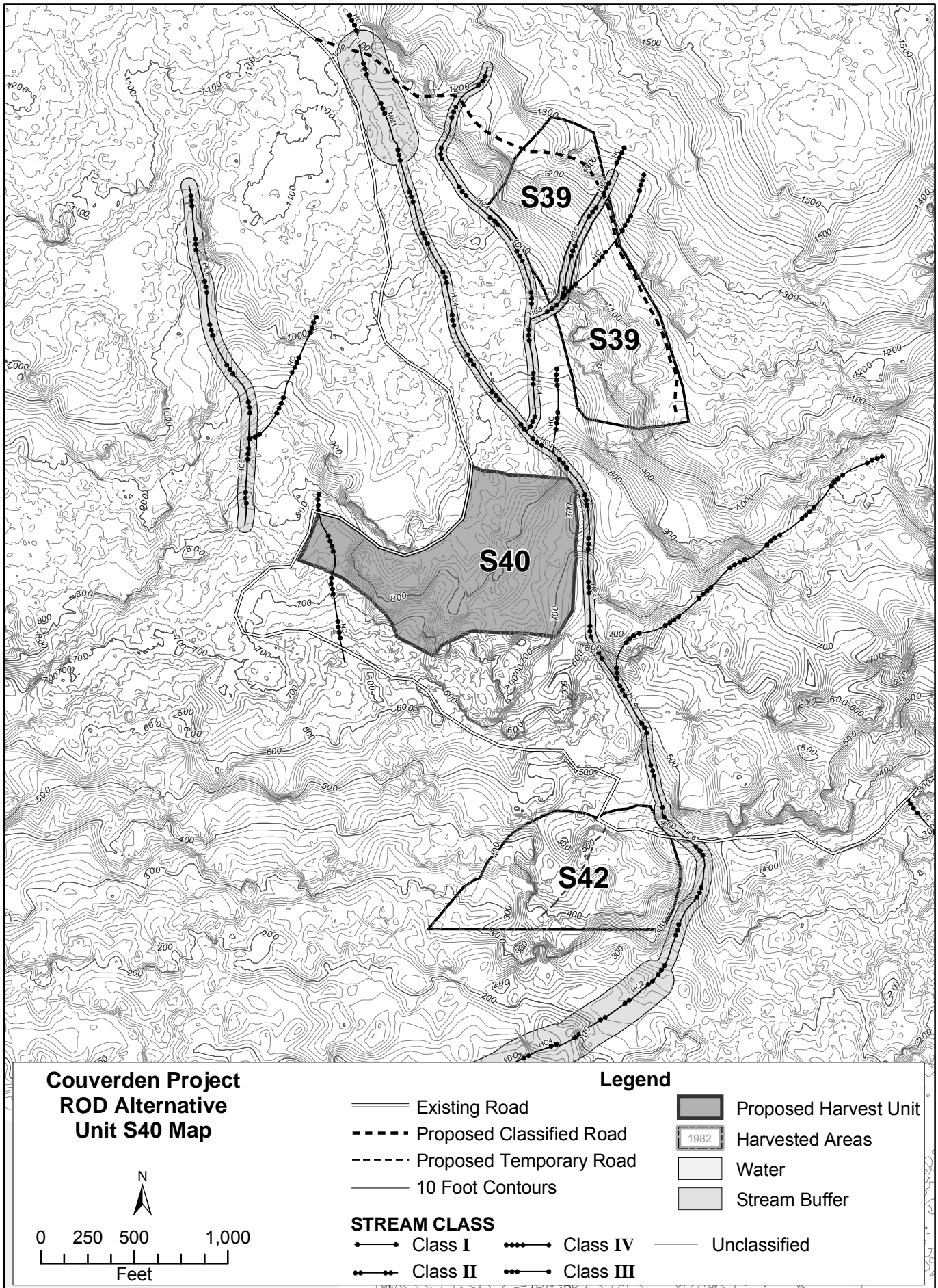
Mitigation: V6. Leave all trees 16" DBH and smaller, plus 5 trees per acre at least 20" DBH to reduce visual contrast. V7. Leave most non-merchantable trees to help reduce visual contrast. V8. Feather the eastern edge of the unit to reduce visual contrast.

Other Resources/Issues

Concern: None

Mitigation:

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COUVERDEN TIMBER SALE(S) - UNIT CARD Unit No. S40 ROD Alternative

Harvest Method: Short skyline

Total Acres: 19

Total Volume: 387 MBF

Volume per Acre: 22 MBF

UNIT DEVELOPMENT

Unit designed to meet VQOs of maximum modification (79%) and partial retention (21%). Unit boundaries are based on Alternative 3. The following mitigation measures were either taken into account during unit design, or they will be applied during project implementation: F1, F2, F3, F14, W1, W7, T1, V1, and V7.

Logging and Transportation: The timber can be yarded using a short skyline system using the existing road as a continuous roadside landing. The southeast corner of the unit has marginal lift and tailholds may be needed across the Class III stream along the eastern boundary. Class III stream will require directional felling away from slope break buffer (BMP 12.6(a), 13.16). The logging system is set up for split yarding all Class III and IV streams. Windthrow is not expected to be a problem after harvest. Middle of the unit is visible from saltwater. See the Visual/Recreation section.

Classified Roads: No new classified roads will be needed. Except for 0.8 mile of the 8550 road, existing roads will remain open and would be available for OHV use.

Temporary Roads: No temporary roads will be needed.

Stand Management Objectives: The future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Treatment: Clearcut with reserve trees. Retention trees should be concentrated in the areas of the unit visible from saltwater. See the Visual/Recreation section. This prescription would optimize the regeneration potential for fiber production (especially for spruce), reduce mistletoe, and would be the most economical harvest method. The prescription is appropriate to meet wildlife, watershed, and other resource objectives.

Regeneration Method: T1. Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

Possible Future Treatments: Possible planting if natural regeneration does not result in fully stocked stand or to increase species diversity, release, and pre-commercial thinning. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old-growth trees in original harvest, plus enough large second-growth trees to meet the 10% reserve requirement.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: A Class IV stream crosses the western portion of the unit and a large V-notch (85% stream slopes) Class III lies along the eastern boundary. Electrofishing confirmed cutthroat trout and Dolly Varden distribution limits to be 2,000 feet downstream from the unit. One large V-notch (105% stream slopes) Class III forms the northwest unit boundary and another small stream bisects the unit. The Class IV channel in the western portion of the unit has some Class III inclusion characteristics.

Mitigation: F1. For the steep sided Class III stream, no programmed harvest within the V-notch or to the sideslope break of the Class III channel, whichever is greater. Manage the area beyond (approximately one site-potential tree height, about 120 feet) for reasonable assurance of windfirmness. F2, F3. The Class IV stream may require directional felling, splitline, partial, or full suspension, especially in the steep sided areas within the unit.

Soils/Wetlands/Karst

Concern: There are 2.1 acres of slopes >55%.

Mitigation: F14. Avoid harvest on unstable slopes (BMP 13.5).

Record of Decision

Wildlife

Concern: Medium- and high-value deer and marten habitat was identified in the south and east portions of the unit. Deer and black bear were visually observed in the lower portion of the unit.

Mitigation: W1, W7. Leave live reserve trees, large culls, and snags where possible to maintain habitat structure and snag density throughout, especially along streams and in the southeastern portion of unit. Concentrate leave trees around large culls and snags to ensure windfirmness.

Visual/Recreation

Concern: Meet the partial retention/maximum modification VQOs. Approximately 11 acres of the harvested unit (within the maximum modification portion of the unit) would be visible from Icy Strait (KVA 4), Ansley Island (KVA 6), Couverden Island (KVA 8), and the private recreation cabin (KVA 5).

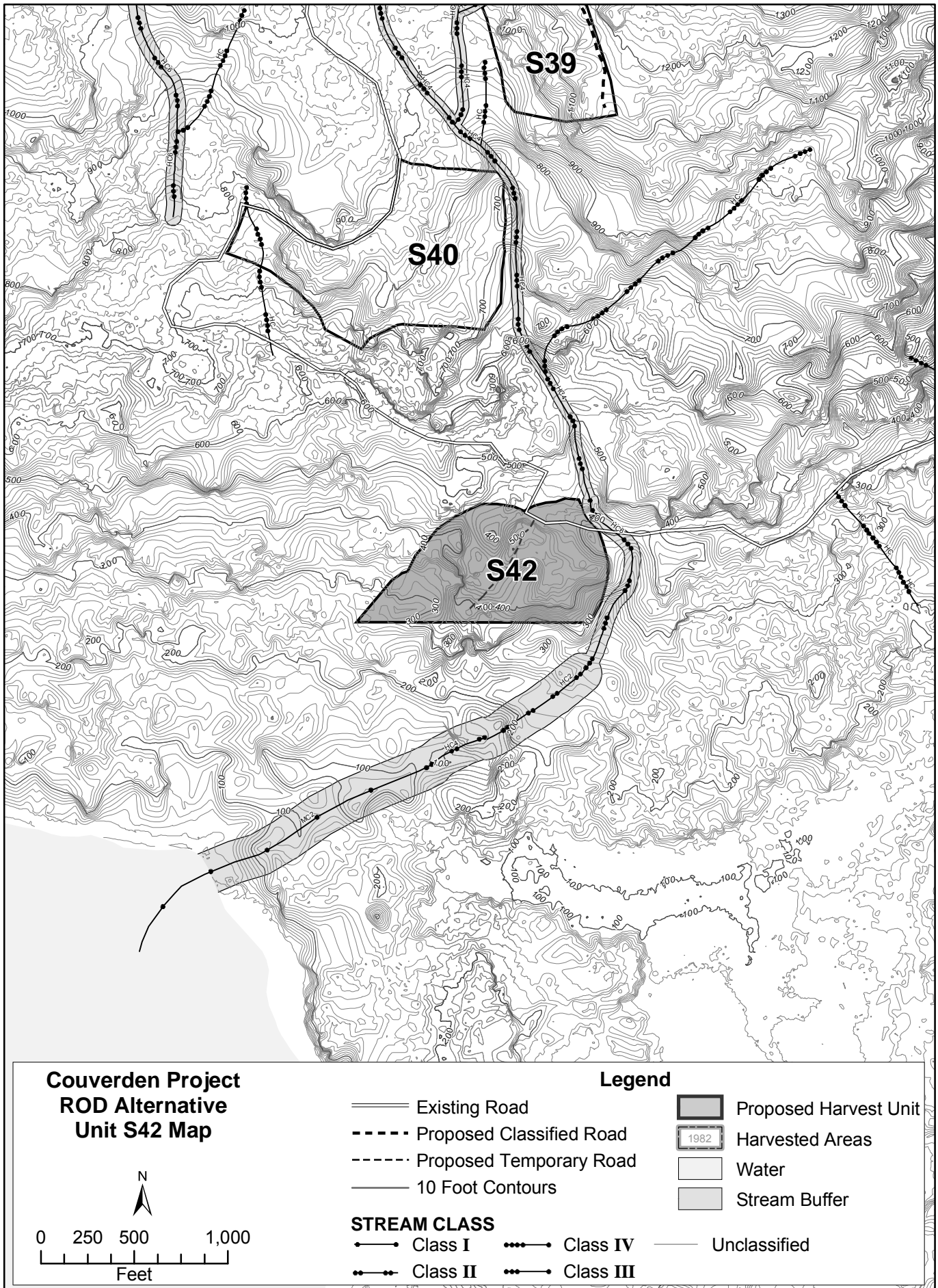
Mitigation: V1. Reserve trees would be concentrated in visible areas and steep areas to reduce visual contrast. V7. Leave most non-merchantable trees to help reduce visual contrast.

Other Resources/Issues

Concern: None

Mitigation:

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COUVERDEN TIMBER SALE(S) - UNIT CARD Unit No. S42 ROD Alternative

Harvest Method: Shovel & Short Skyline

Total Acres: 15

Total Volume: 456 MBF

Volume per Acre: 39 MBF

UNIT DEVELOPMENT

Unit designed to meet VQO of partial retention. Unit boundaries are based on Alternative 3. The following mitigation measures were either taken into account during unit design, or they will be applied during project implementation: F1, F2, F14, T1, W6, W7, V6, and V7.

Logging and Transportation: The timber can be yarded using shovel and short skyline system using the existing and proposed temporary road as continuous roadside landings. There are two settings with in the unit. Setting A can be logged with a combination of short skyline and shovel. Setting B is all short skyline system using the planned landing location at the end of the proposed road. A Class III stream along the eastern boundary will require directional felling away from slope break buffer (BMP 12.6(a), 13.16). Windthrow is not expected to be a problem after harvest. Half of the unit is visible from saltwater.

Classified Roads: No new classified roads will be needed. Except for 0.8 mile of the 8550 road, existing roads will remain open and would be available for OHV use.

Temporary Roads: Approximately 0.1 mile of temporary road will be needed in the unit. The temporary road will be obliterated after use.

Stand Management Objectives: The future stand will be two-aged, tending towards uneven-age over time with a mix of large- and medium-size trees and seedlings and saplings.

Treatment: Single tree selection and group selection. Areas of the unit that are flat and at the top and bottom of the unit will be group selection. Clearing will consist of 0.25- to 2-acre openings. Sloped portions of the unit will be diameter cut, leaving trees less than 16" DBH, plus 5 trees per acre 20" DBH or larger. Retention trees should be selected based on windfirmness and should be distributed as to minimize visual impacts. To provide protection for the Class III stream to the east of the unit, a 50- to 100-foot windfirm buffer should be left along the entire length of the unit/setting boundaries using individual tree selection for harvest.

Regeneration Method: T1. Natural regeneration. The new stand is likely to be mostly hemlock.

Possible Future Treatments: Possible planting if natural regeneration does not result in fully stocked stand or to increase species diversity; no release or pre-commercial thinning expected. Similar harvests every 50 to 60 years. Future entries will maintain a minimum of 10% by volume of the stand in mature trees and 20% retention trees.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: One large steep, highly incised (up to 60-foot) V-notch Class III stream borders the unit to the east. This stream has shown recent movement of large boulders and has very steep sideslopes abutting the unit. Electrofishing confirmed that fish (cutthroat trout and Dolly Varden) reach to within nearly 300 feet of the unit boundary. High gradient chutes (more than 50% slope) and repeating small falls (3 to 4 feet) block upstream movement of anadromous fish; therefore, the stream class was changed from Class II to Class III along the unit boundary. High-gradient areas in the northeast central area have the potential to add sediment to the channel leading to downstream fish habitat if disturbed.

Mitigation: F1. Limit tree extraction in the high gradient portion of the unit to reduce potential for slope instability leading to sediment effects to downstream fish habitat. No programmed harvest within the V-notch or to the sideslope break (which is near 100 feet in places along the unit) of Class III channel, whichever is greater. Manage the area beyond (approximately one site-potential tree height, about 120 feet) for reasonable assurance of windfirmness. F2. Directional felling along the buffer is required.

Soils/Wetlands/Karst

Concern: There are 0.6 acre of >72% slopes in the southeastern portion of the unit.

Mitigation: F14. Avoid harvest on slopes >72% and unstable slopes (BMP 13.5). Keep unit boundary above the steep area southeast of the unit.

Record of Decision

Wildlife

Concern: Medium-value marten habitat was identified across unit.

Mitigation: W6, W7. Leave live reserve trees, large culls, and snags where possible to maintain habitat structure and snag density throughout. Concentrate leave trees around large culls and snags to ensure windfirmness.

Visual/Recreation

Concern: Meet the partial retention VQO. Approximately 9 acres of the harvested unit would be visible from Icy Strait (KVA 4)

Mitigation: V6. Leave trees 16" DBH and smaller, plus 5 trees per acre at least 20" DBH in the unit. V7. Leave most non-merchantable trees to help reduce visual contrast.

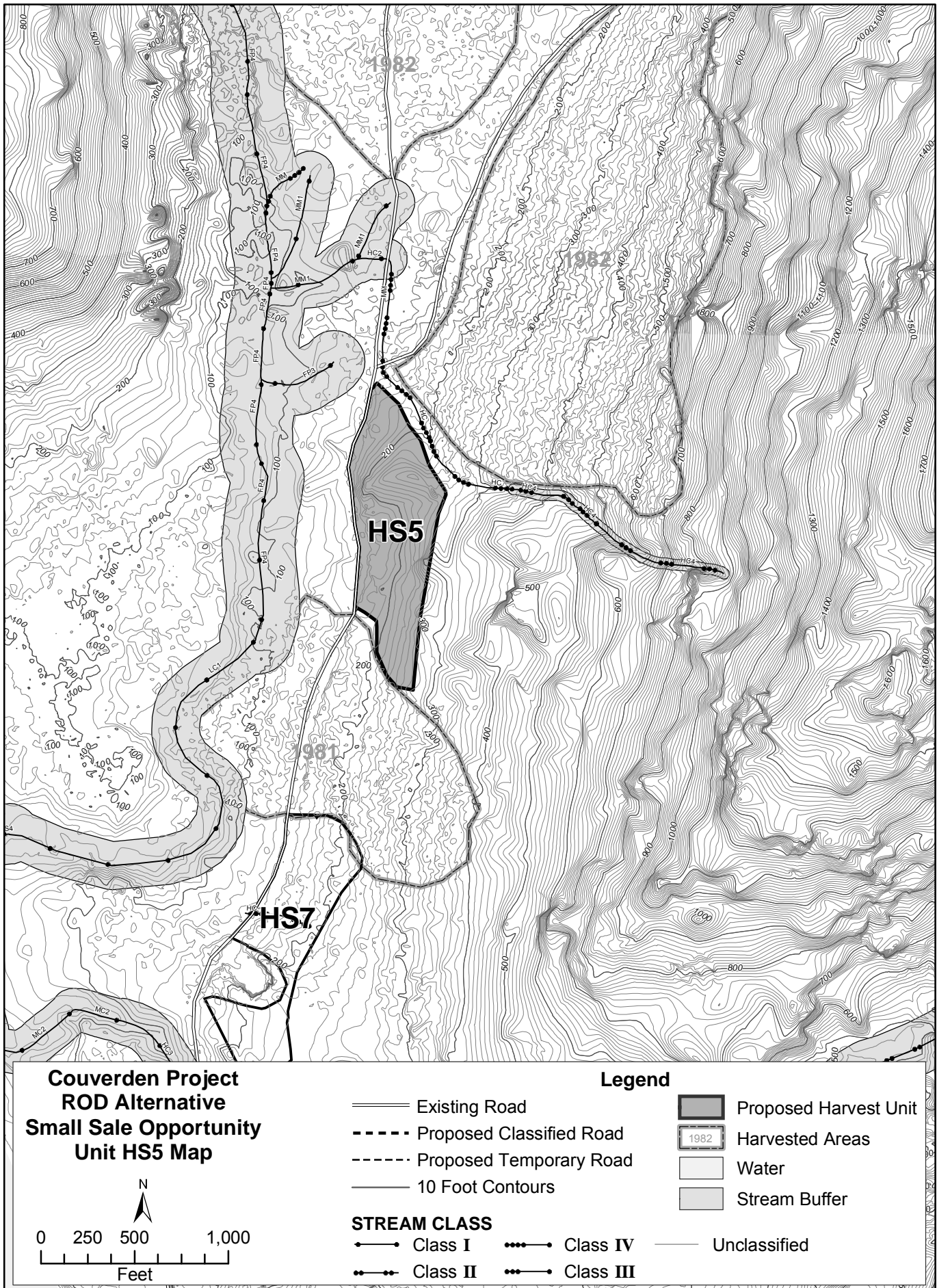
Other Resources/Issues

Concern: None

Mitigation:

Small Sale Opportunities

The following unit cards pertain to those portions of units in the Selected Alternative that could be offered as small sale. If sold as small sales, these portions would be removed from future larger sales.



COUVERDEN TIMBER SALE(S) - UNIT CARD Unit No. HS5 Small Sale Opportunity

Harvest Method: Short Skyline (cable)

Total Acres: 12 Total Volume: 435 MBF Volume per Acre: 46 MBF

UNIT DEVELOPMENT

This unit consists of Setting C of ROD Unit HS5 and is designed to meet the small sale opportunity. The following mitigation measures were either taken into account during unit design, or they will be applied during project implementation: F1, F2, F3, F14, T1, W6, W7, W23, V6, and V7.

Logging and Transportation: The timber can be yarded using a short skyline system using Road 8550 for continuous roadside landings. Tail trees are required, including some tail holds in the stream buffer. Class III stream, V-notch along the western boundary will require directional felling away from slope break buffer (BMP 12.6(a), 13.16). V-notch stream on the north boundary abuts an old clearcut. The buffer on the V-notch may be prone to windthrow. Harvest within 500 feet of Road 8550. The upper part of the unit is visible from saltwater.

Classified Roads: No new classified roads will be needed to access the unit. Existing road requires extensive brushing, placement of culverts, and re-rocking. Except for 0.8 mile of the 8550 road, existing roads will remain open and would be available for OHV use.

Temporary Roads: No temporary roads will be needed.

Stand Management Objectives: The future stand will be two-aged, tending towards uneven-age over time with a mix of large- and medium-size trees and seedlings and saplings.

Treatment: Single tree selection and group selection. Wildlife buffer will be left between the Homeshore Creek and Road 8550. See the Wildlife section. The group selection cuts will consist of logging 2-acre strips, harvesting about half the area. Harvest will only occur within 500 feet of Road 8550. To provide protection for the Class III V-notch on the north end of the unit, a 50- to 100-foot feathered windfirm buffer should be left along the entire length of the unit boundary.

Regeneration Method: T1. Natural regeneration. The stand is likely to be a mixture of species similar to the existing stand.

Possible Future Treatments: Possible planting if natural regeneration does not result in fully stocked stand or to increase species diversity; no release or pre-commercial thinning planned. Future single tree selection and group selections every 50 to 60 years. Future entries will maintain a minimum of 20% retention trees.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: The unit is bordered to the north by one small Class III/IV stream, which has a moderate size V-notch portion near the upper half of the unit (Class III) before entering the less incised lower portion of the (Class IV) channel. This stream becomes a roadside ditch for more than 500 feet before passing through a pond area and becoming a Class I stream tributary to Homeshore Creek.

Mitigation: F1. The upper Class III portion of the stream should have no programmed harvest within V-notch or side slope break of Class III channel. Manage the area beyond (approximately one site-potential tree height) for reasonable assurance of windfirmness. F2, F3. The lower part of the stream may require directional felling, splitline, partial, or full suspension for Class IV portion of this channel.

Soils/Wetlands/Karst

Concern: There are three landslides within 0.5 mile of the unit. One of the landslides is located in a Class III V-notch on the north side of the unit.

Mitigation: F1. Maintain stream and windfirm buffer (BMP 12.6(a), 13.16) to protect Class III V-notch stream.

Wildlife

Concern: Unit contains high-volume, high-structure habitat for deer and marten and is adjacent to critical brown bear foraging buffer. Documented travel corridors throughout unit. The unit is adjacent to an important brown bear feeding stream.

Mitigation: W6, W7. Use uneven-age management and leave non-merchantable trees and snags to provide habitat diversity over time. Seasonal restrictions may apply during brown bear foraging activities. W23. Maintain a 500-foot buffer along Homeshore Creek to provide cover for brown bears.

Record of Decision

Visual/Recreation

Concern: Meet VQO of partial retention. Approximately 5 acres of the harvested unit is visible from Homeshore Bay and Icy Strait (KVAs 2 and 4, respectively).

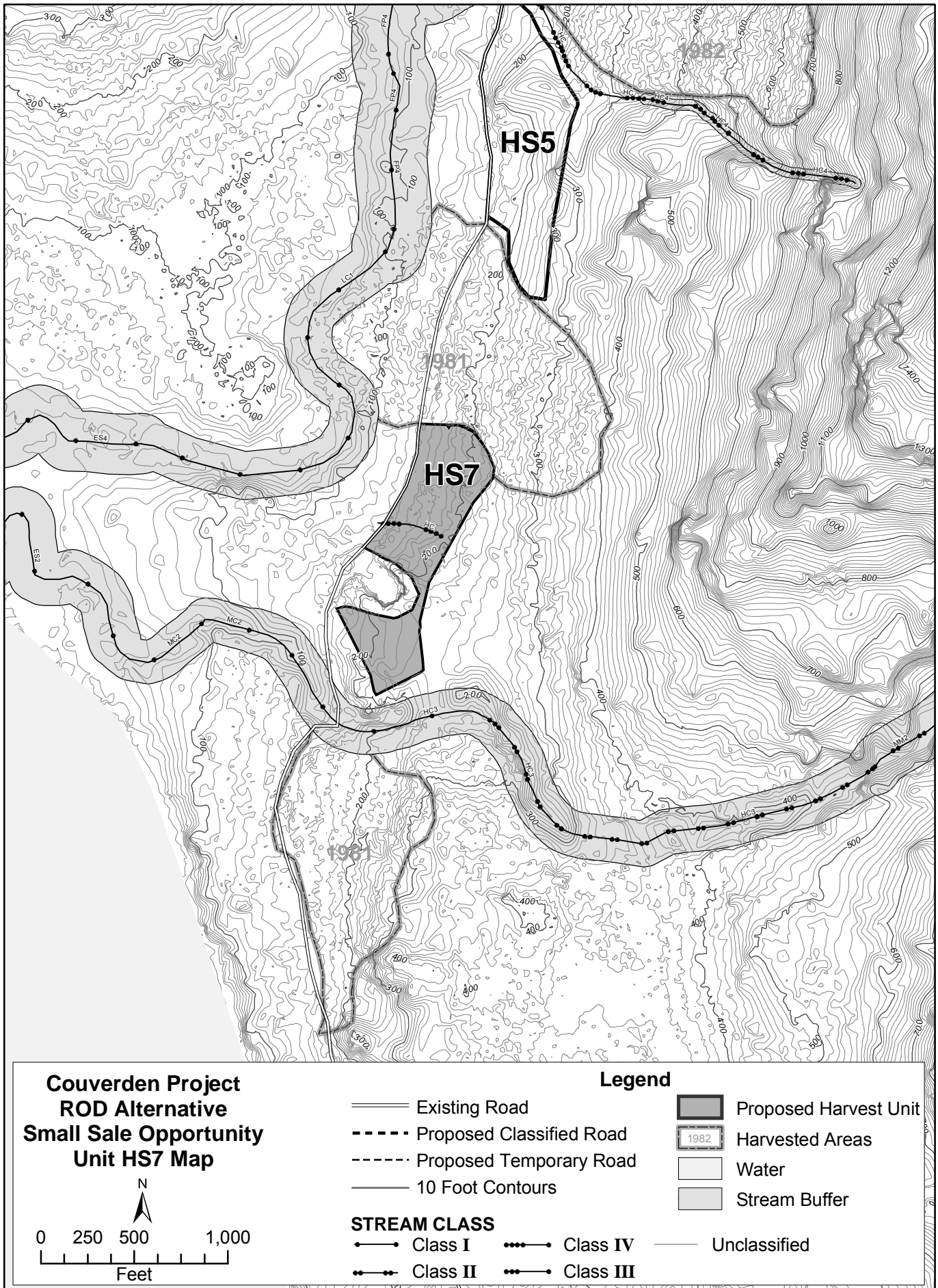
Mitigation: V6. Leave trees 18" DBH, plus 5 trees per acre larger than 20" DBH in remainder of unit. V7. Leave most non-merchantable trees to help reduce visual contrast.

Other Resources/Issues

Concern: None

Mitigation:

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COUVERDEN TIMBER SALE(S) - UNIT CARD Unit No. HS7 Small Sale Opportunity

Harvest Method: Short Skyline (cable)

Total Acres: 10 Total Volume: 173 MBF

Volume per Acre: 21 MBF

UNIT DEVELOPMENT

This unit consists of Setting B of ROD Unit HS7 and is designed to meet the small sale opportunity. The following mitigation measures were either taken into account during unit design, or they will be applied during project implementation: F1, F2, F3, F14, T1, W6, W7, W23, V6, and V7.

Logging and Transportation: The timber can be yarded with a short skyline system using the existing road as a continuous roadside landing. Harvest within 500 feet of Road 8550. Guylines will be anchored out of unit in stream buffer in southwest corner of unit. Windthrow is not expected to be a problem after harvest. Class I stream along the southern boundary will require directional felling away from slope break buffer (BMP 12.6(a), 13.16). Obtain partial suspension over Class IV streams within unit. A small portion of the upper part of the unit is visible from saltwater.

Classified Roads: No new classified road will be needed to access the unit. Except for 0.8 mile of the 8550 road, existing roads will remain open and would be available for OHV use.

Temporary Roads: No temporary road will be needed.

Stand Management Objectives: The future stand will be two-aged, tending towards uneven-age over time with a mix of large- and medium-size trees and seedlings and saplings.

Treatment: Single tree selection and group selection. Harvest 2-acre strips. Harvest will only occur within 500 feet of Road 8550.

Regeneration Method: T1. Natural regeneration. The stand is likely to be a mixture of species similar to the existing stand.

Possible Future Treatments: Possible planting if natural regeneration does not result in fully stocked stand or to increase species diversity; no release or pre-commercial thinning expected. Future entries will maintain a minimum of 10% by volume of the stand in mature trees and 20% retention trees. Plan a similar entry every 50 to 60 years.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: A medium-sized Class I stream bounds the unit to the south. The stream bank is moderately steep and disturbance on the slope may result in sediment delivery to the stream. One short Class IV stream is present near the existing main road (8550) in the lower west portion of the unit.

Mitigation: F1. No commercial harvest within 100 feet of the Class I stream channel to the south or the top of V-notch, whichever is greater. Manage the area beyond (approximately one site-potential tree height, about 120 feet) for reasonable assurance of windfirmness. F2, F3. The short midunit IV stream may require directional felling, splitline, partial, or full suspension.

Soils/Wetlands/Karst

Concern: There are two landslides within 0.5 mile of unit. Class I stream south of unit.

Mitigation: F14. Avoid harvest on unstable slopes (BMP 13.5).

Wildlife

Concern: Unit contains high-volume, high-structure habitat for deer and marten habitat and is adjacent to critical brown bear foraging buffer. Documented travel corridors throughout unit.

Mitigation: W6, W7. Use uneven-age management and retain non-merchantable trees and snags to provide habitat diversity over time. Seasonal restrictions may apply during brown bear foraging activities. W23. Maintain a 500-foot buffer along Homeshore Creek to provide cover for brown bears.

Visual/Recreation

Concern: Meet the partial retention VQO. Approximately 1 acre of the harvested unit would be visible from Homeshore Bay and Icy Strait (KVAs 2 and 4, respectively).

Mitigation: V6. Leave trees 16" DBH and smaller, plus 5 trees per acre at least 20" DBH in remainder of unit. V7. Leave most non-merchantable trees to help reduce visual contrast.

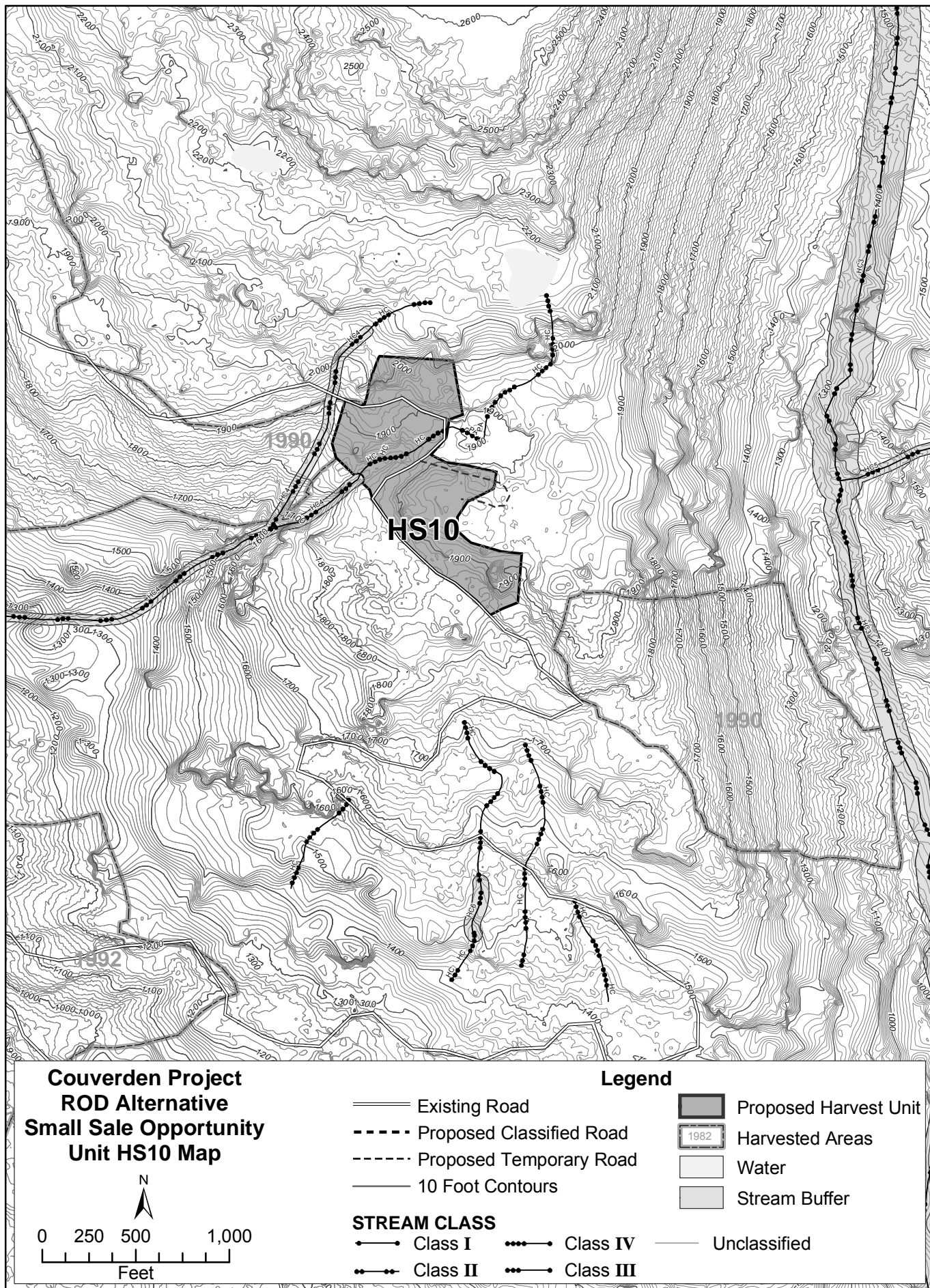
Record of Decision

Other Resources/Issues

Concern: None

Mitigation:

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COUVERDEN TIMBER SALE(S) - UNIT CARD Unit No. HS10 Small Sale Opportunity

Harvest Method: Shovel & Short Skyline (cable)

Total Acres: 15 Total Volume: 530 MBF Volume per Acre: 39 MBF

UNIT DEVELOPMENT

This unit is the same as ROD Unit HS10 and is designed to meet the small sale opportunity. The following mitigation measures were either taken into account during unit design, or they will be applied during project implementation: F1, F2, F3, F10, F11, T1, W1, W7, V1, and V7.

Logging and Transportation: The timber can be yarded with a shovel and a short skyline system using the existing road and proposed temporary road as a continuous roadside landing. A small portion of the unit along the eastern boundary will be shovel ground. The majority of the unit is a skyline system with short yarding distances. There is one Class IV stream in the unit. This stream turns to a Class III stream at the west end of the unit and will require buffering (BMP 12.6(a), 13.16). Partial suspension can be achieved when necessary to yard over stream. Blowdown was found; windthrow may be a concern in the southwest corner of the unit after harvest. Portions of this unit will be visible from saltwater.

Classified Roads: No new classified road will be needed to access the unit. Except for 0.8 mile of the 8550 road, existing roads will remain open and would be available for OHV use.

Temporary Roads: Approximately 0.58 mile of temporary road will be needed. The temporary road will be obliterated after use.

Stand Management Objectives: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Treatment: Clearcut with reserve trees. Leave reserve tree patches along western boundary north of stream to provide windfirm buffer. The eastern half of the unit was dropped because it has poor timber and provides a travel corridor for wildlife to the alpine. In addition it is cost prohibitive to access the east half of the unit given the low value of the timber available. This prescription would optimize the regeneration potential for fiber production (especially for spruce), reduce mistletoe, and would be the most economical harvest method. As well the prescription is appropriate to meet wildlife, watershed, and other resource objectives. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old-growth trees in original harvest, plus enough large second-growth trees to meet the 10% reserve requirement.

Regeneration Method: T1. Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

Possible Future Treatments: Possible planting if natural regeneration does not result in fully stocked stand or to increase species diversity, release, and pre-commercial thinning. Similar harvest in approximately 100 years.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: One Class IV stream (draining a small pond) passes through the middle of the unit. It changes to a Class III channel at the unit boundary. The Class III portion could be affected by harvest. Another stream is near the unit boundary to the northwest containing Class III and IV channels. A small portion of this channel could be influenced by harvest practices. Based on electrofishing downstream, this unit is over 5,000 feet upstream of fish habitat.

Mitigation: F1. No programmed harvest within V-notch or side slope break of Class III channel and manage the area beyond (approximately one site-potential tree height about 120 feet) for reasonable assurance of windfirmness. F2, F3. The Class IV stream that traverses the unit center may require directional felling, splitline, partial, or full suspension within the unit.

Soils/Wetlands/Karst

Concern: There is a wetland east of the unit.

Mitigation: F10. Modify temporary road location to minimize impacts to wetlands. F11. Modify logging system to avoid or minimize damage to wetland.

Wildlife

Concern: This unit is designed as a clearcut.

Mitigation: W1, W7. Use clearcut with reserves system and retain non-merchantable trees and snags to maintain habitat diversity.

Record of Decision

Visual/Recreation

Concern: Meet the maximum modification VQO. Approximately 2 acres in the northwest of the harvested unit would be visible from Icy Strait (KVAs 4).

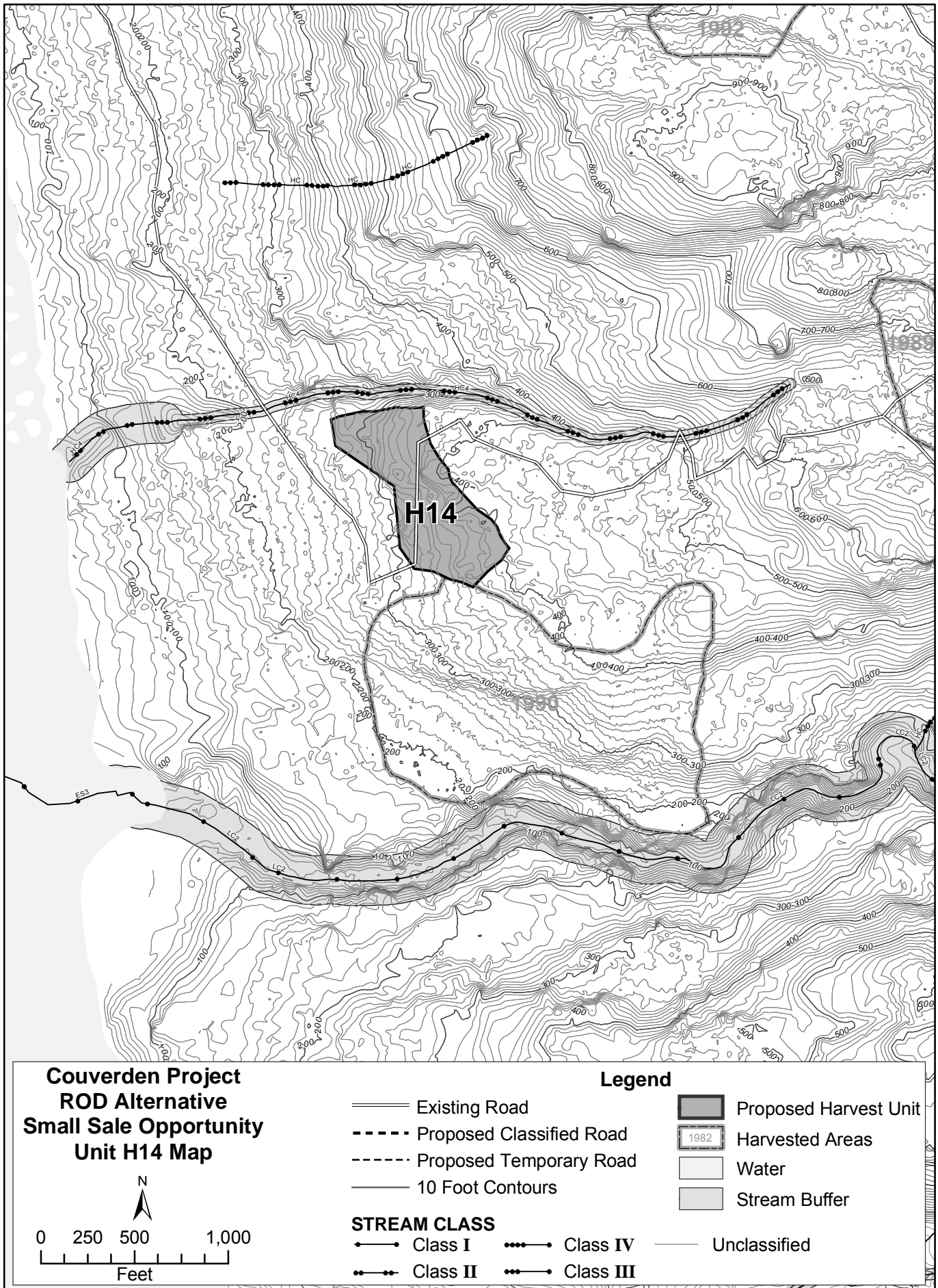
Mitigation: V1. Reserve trees would be concentrated in visible areas and steep areas to reduce visual contrast. V7. Leave most non-merchantable trees to help reduce visual contrast.

Other Resources/Issues

Concern: None

Mitigation:

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COUVERDEN TIMBER SALE(S) - UNIT CARD Unit No. H14 Small Sale Opportunity

Harvest Method: Shovel & short skyline (cable)

Total Acres: 10 Total Volume: 144 MBF Volume per Acre: 19 MBF

UNIT DEVELOPMENT

This unit is the same as ROD Unit HS14 and is designed to meet the small sale opportunity. The following mitigation measures were either taken into account during unit design, or they will be applied during project implementation: F1, F2, T1, W6, W7, V5, V6, and V7.

Logging and Transportation: The timber can be yarded with a shovel and short skyline system using the existing road as a continuous roadside landing. Short skyline system will be used below Road 8553, and shovel yarding will be used above the road. Class III stream along the northern boundary will require a slope break buffer (BMP 12.6(a), 13.16). There are some concerns for windthrow along the northern boundary. Unit is partially visible from saltwater.

Classified Roads: No new classified roads will be needed to access the unit. Except for 0.8 mile of the 8550 road, existing roads will remain open and would be available for OHV use.

Temporary Roads: No temporary road will be needed to access the unit.

Stand Management Objectives: The future stand will be two-aged, tending towards uneven-age over time with a mix of large- and medium-size trees and seedlings and saplings.

Treatment: Single tree selection and group selection. Diameter cut below the road and group selection above the road. Diameter cut will leave trees less than 16" DBH, plus 5 trees per acre at least 20" DBH. Retention trees should be selected based on windfirmness and should be distributed as to minimize visual impacts. The group selection will consist of logging 2-acre areas harvesting about half the area above the road.

Regeneration Method: T1. Natural regeneration. The new stand is likely to be mostly hemlock.

Possible Future Treatments: Possible planting if natural regeneration does not result in fully stocked stand or to increase species diversity; release and pre-commercial thinning may be needed in patch cuts. Similar harvests every 50 to 60 years. Future entries will maintain a minimum of 10% by volume of the stand in mature trees and 20% retention trees.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: A large Class III stream borders the north part of the unit. This stream channel has signs of sliding on the north channel sideslope. Electrofishing downstream confirmed that only resident fish (Dolly Varden and cutthroat trout) are present in this stream (about 800 feet below this unit to saltwater).

Mitigation: F1. Class III channel. No programmed harvest within V-notch or side slope break of the channel. Manage the area beyond (approximately one site-potential tree height, about 120 feet) for reasonable assurance of windfirmness. Any slide areas along this bank should receive an additional buffer. F2. Directional felling along buffers may be required.

Soils/Wetlands/Karst

Concern: None

Mitigation:

Wildlife/TES Plants

Concern: W6, W7. No concern because habitat diversity on a stand level is provided over time by using the selection method (uneven-aged system) as a harvest prescription.

Mitigation:

Visual/Recreation

Concern: Meet the partial retention VQO. Approximately 10 acres of the harvested unit would be visible from Icy Strait and Homeshore Bay (KVAs 4 and 2, respectively).

Mitigation: V5. Patch cuts will be used to reduce visual contrast on benches. V6. Trees 16" DBH and smaller, plus 5 trees per acre at least 20" DBH will be left on steeper slopes. V7. Leave most non-merchantable trees to help reduce visual contrast.

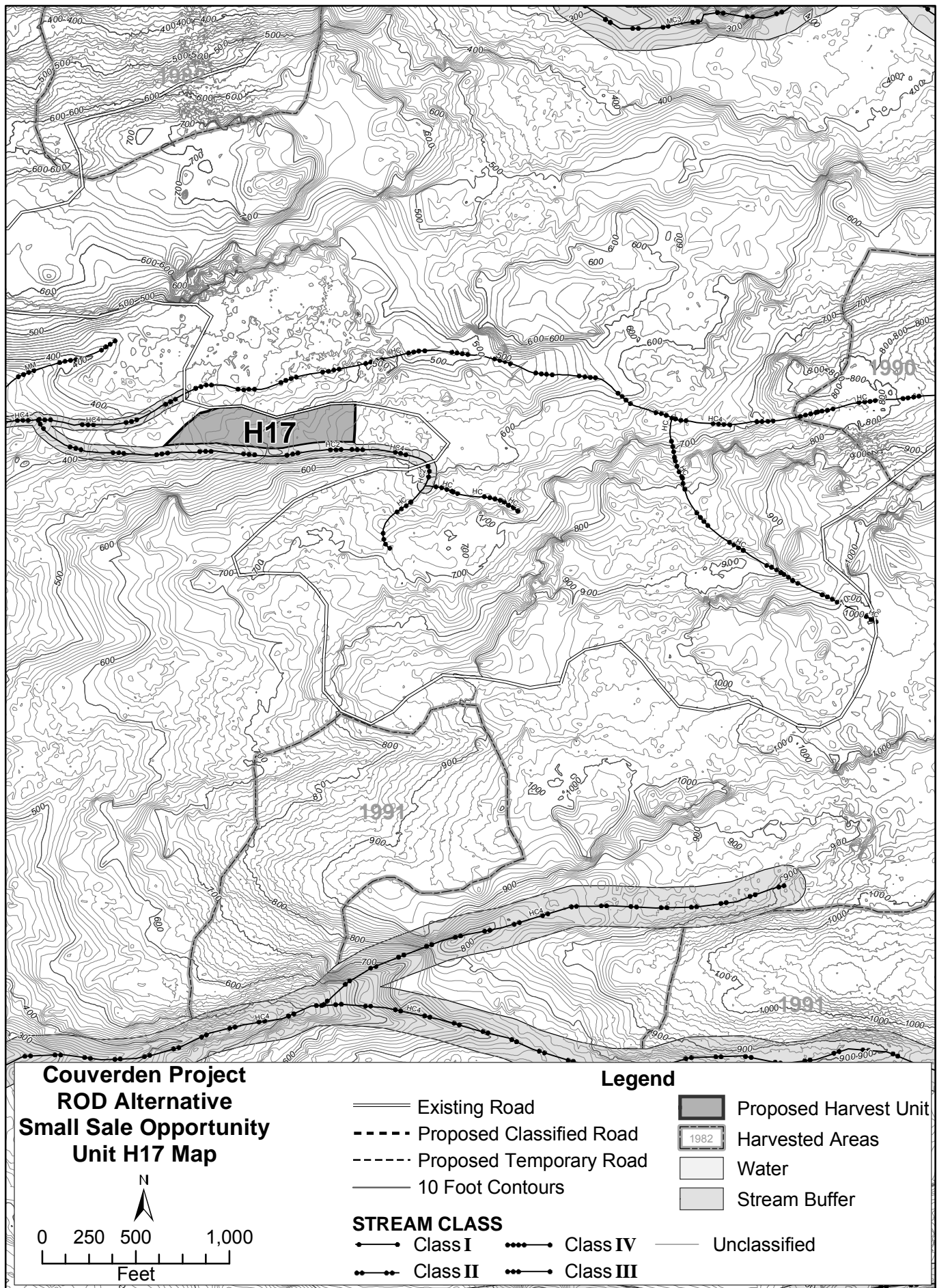
Record of Decision

Other Resources/Issues

Concern: None

Mitigation:

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COUVERDEN TIMBER SALE(S) - UNIT CARD Unit No. H17 Small Sale Opportunity

Harvest Method: Shovel

Total Acres: 4 Total Volume: 54 MBF Volume per Acre: 17 MBF

UNIT DEVELOPMENT

This unit consists of the northwest portion of ROD Unit H17 and is designed to meet the small sale opportunity. The unit includes suitable timber within 500 feet of Road 8562. The following mitigation measures were either taken into account during unit design, or they will be applied during project implementation: F1, T1, W6, W7, V1, V6, and V7.

Logging and Transportation: The timber can be yarded using a shovel logging system. A Class III stream along the northern boundary will require directional felling away from slope break buffer. The only windthrow concerns would be the western boundary and the Class III stream buffer. Half the unit is visible from saltwater.

Classified Roads: No new classified roads will be needed to access the unit. Except for 0.8 mile of the 8550 road, existing roads will remain open and would be available for OHV use.

Temporary Roads: No temporary roads will be needed to access the unit.

Stand Management Objectives: The future stand will be two-aged, tending towards uneven-age over time with a mix of large and medium size trees and seedlings and saplings.

Treatment: Single tree selection and group selection. Group selection on the benches and on all areas yarded downhill. Group selection areas would allow for spruce regeneration while meeting the VQO requirements. Group selection will consist of logging 2-acre patches.

Regeneration Method: T1. Natural regeneration. Majority of unit is hemlock.

Possible Future Treatments: Possible planting if natural regeneration does not result in fully stocked stand or to increase species diversity; release and pre-commercial thinning may be needed in the patch cut areas. Similar harvests every 50 to 60 years. Future entries will maintain a minimum of 10% by volume of the stand in mature trees and 20% retention trees.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: There is one Class III stream along the south border of the unit. There is a Class IV stream to the north of the unit. The Class III stream was originally designated as Class II. It was changed to a Class III after electrofishing 1,500 feet downstream of the unit did not find any fish.

Mitigation: F1. The Class III channel should have no programmed harvest within the V-notch or sideslope break of the Class III channel. Manage the area beyond (approximately one site-potential tree height, about 120 feet) for reasonable assurance of windfirmness.

Soils/Wetlands/Karst

Concern: None.

Mitigation:

Wildlife

Concern: Unit contains medium-value deer winter habitat and medium- to high-value marten habitat through center of unit running north and south.

Mitigation: W6, W7. Provide greater habitat diversity by using uneven-aged management and retaining non-merchantable trees and snags.

Visual/Recreation

Concern: Meet the Partial Retention or Maximum Modification VQO. The harvested unit would be visible from Icy Strait (KVA 4) and Homeshore Bay (KVA 2).

Mitigation: V6. Leave trees 16" DBH and smaller, plus 5 trees per acre at least 20" DBH to reduce visual contrast. V7. Leave most non-merchantable trees to help reduce visual contrast. V1. Reserve trees would be concentrated in the visible areas, especially in areas with an intermediate VAC (e.g., the steeper areas).

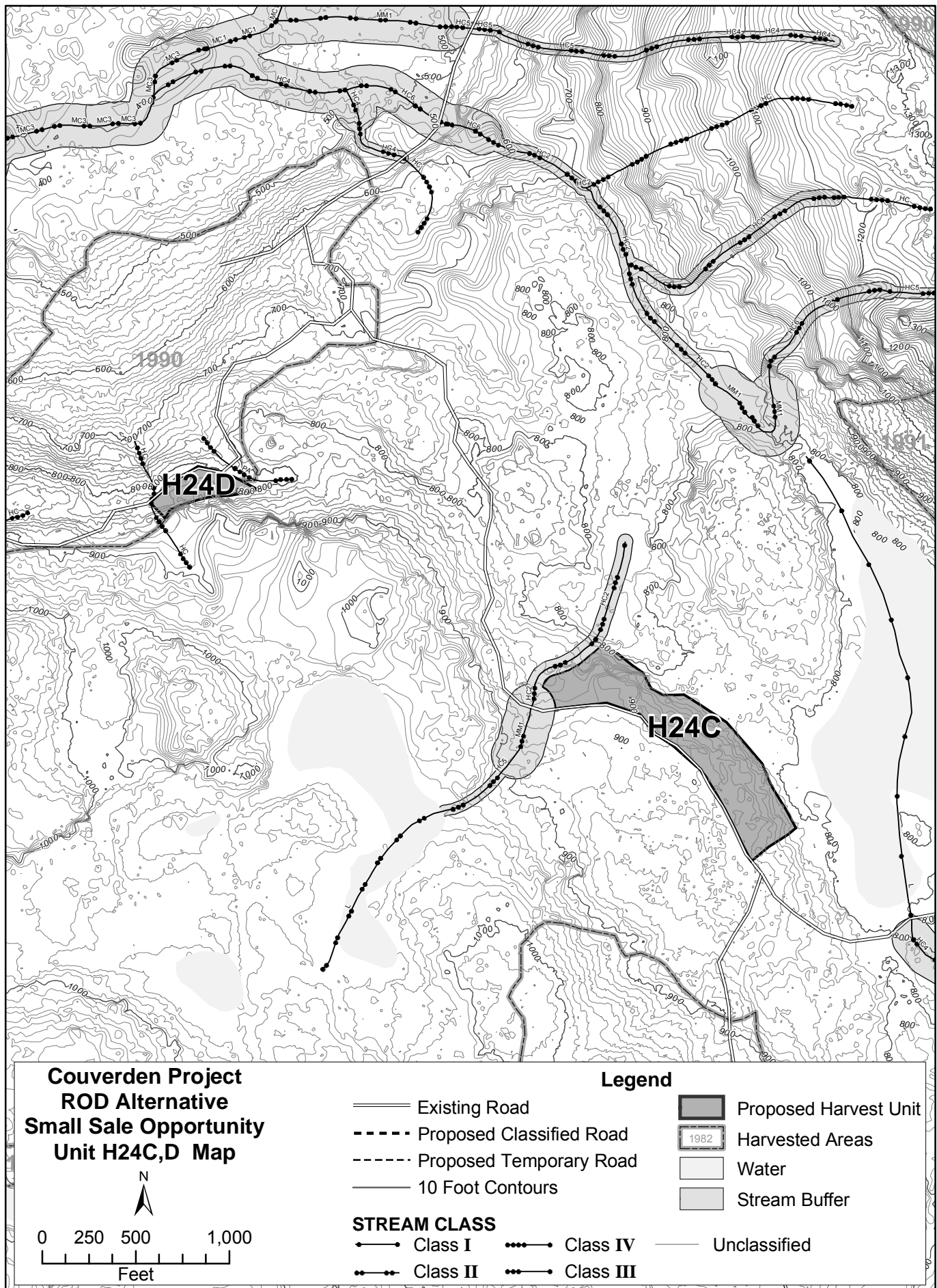
Record of Decision

Other Resources/Issues

Concern: None

Mitigation:

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COUVERDEN TIMBER SALE(S) - UNIT CARD Unit No. H24

Small Sale Opportunity

Harvest Method: Short Skyline (cable)

Total Acres: 9 Total Volume: 179 MBF Volume per Acre: 18 MBF

UNIT DEVELOPMENT

This unit consists of Setting C and a few acres on the north side of Setting D of ROD Unit H24 and is designed to meet the small sale opportunity. The following mitigation measures were either taken into account during unit design, or they will be applied during project implementation: F1, F2, F3, W6, W7, T1, V1, and V7.

Logging and Transportation: The timber can be yarded using a short skyline system using the existing roads as continuous roadside landings. Harvest within 500 feet of Roads 8553 and 8562. Dropped some areas within 500 feet of a road due to steep slopes and logging constraints. Unit has inclusions of low quality and volume timber that could be left as reserve areas in the unit. Class III stream, along the northern boundary of Setting C, will require slope break buffer (BMP 12.6(a), 13.16). Windthrow is not expected to be a problem after harvest. The two Class IV segments may require directional felling, splitline, partial, or full suspension.

Classified Roads: No new classified roads will be needed to access the unit. Except for 0.8 mile of the 8550 road, existing roads will remain open and would be available for OHV use.

Temporary Roads: No temporary roads will be needed to access the unit.

Stand Management Objectives: Future stand will be two-aged, tending toward uneven-age over time with a mix of large- and medium-size trees, seedlings, and saplings

Treatment: Clearcut with reserve trees. Leave reserve trees, snags, and non-merchantable trees to minimize visual impacts. See the Visual/Recreation section. This prescription would optimize the regeneration potential for fiber production (especially for spruce), reduce mistletoe, and would be the most economical harvest method. The prescription is appropriate to meet wildlife, watershed, and other resource objectives.

Regeneration Method: T1. Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

Possible Future Treatments: Possible planting if natural regeneration does not result in fully stocked stand or to increase species diversity, release, and pre-commercial thinning. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old-growth trees in original harvest, plus enough large second-growth trees to meet the 10% reserve requirement.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: The unit is bordered by a Class I lake, one Class III stream, and two Class IV streams. The Class I lake borders the northeast portion of H24C. Minnow traps determined that Dolly Varden were present in this lake. The Class III stream borders unit sections H24C. The two Class IV streams border H24D to the north and northeast.

Mitigation: F1. No programmed commercial harvests within 100 feet of the lake margin or riparian area (typically the height of one site-potential tree), whichever is greater. An additional 100 feet the area beyond this area is recommended to protect the scenic values of the Class I lake. Manage the area beyond this area (approximately one site-potential tree height) for reasonable assurance of windfirmness for both lakes. No programmed harvests within the V-notch or sideslope break of the Class III channel. Manage the area beyond (approximately one site-potential tree height about 120 feet) for reasonable assurance of windfirmness. F 2, F3. The two Class IV segments may require directional felling, splitline, partial, or full suspension.

Soils/Wetlands/Karst

Concern: None.

Mitigation:

Wildlife

Concern: A Vancouver Canada goose with seven goslings was observed near south end of H24C. A deer antler was also found in H24C.

Record of Decision

Mitigation: W1, W7. Leave live reserve trees, large culls, and snags where possible to maintain habitat structure and snag density throughout. Concentrate leave trees around large culls and snags to ensure windfirmness. If other nests are located during implementation, provide a minimum distance of 330 feet between harvest activities and nest site.

Visual/Recreation

Concern: None

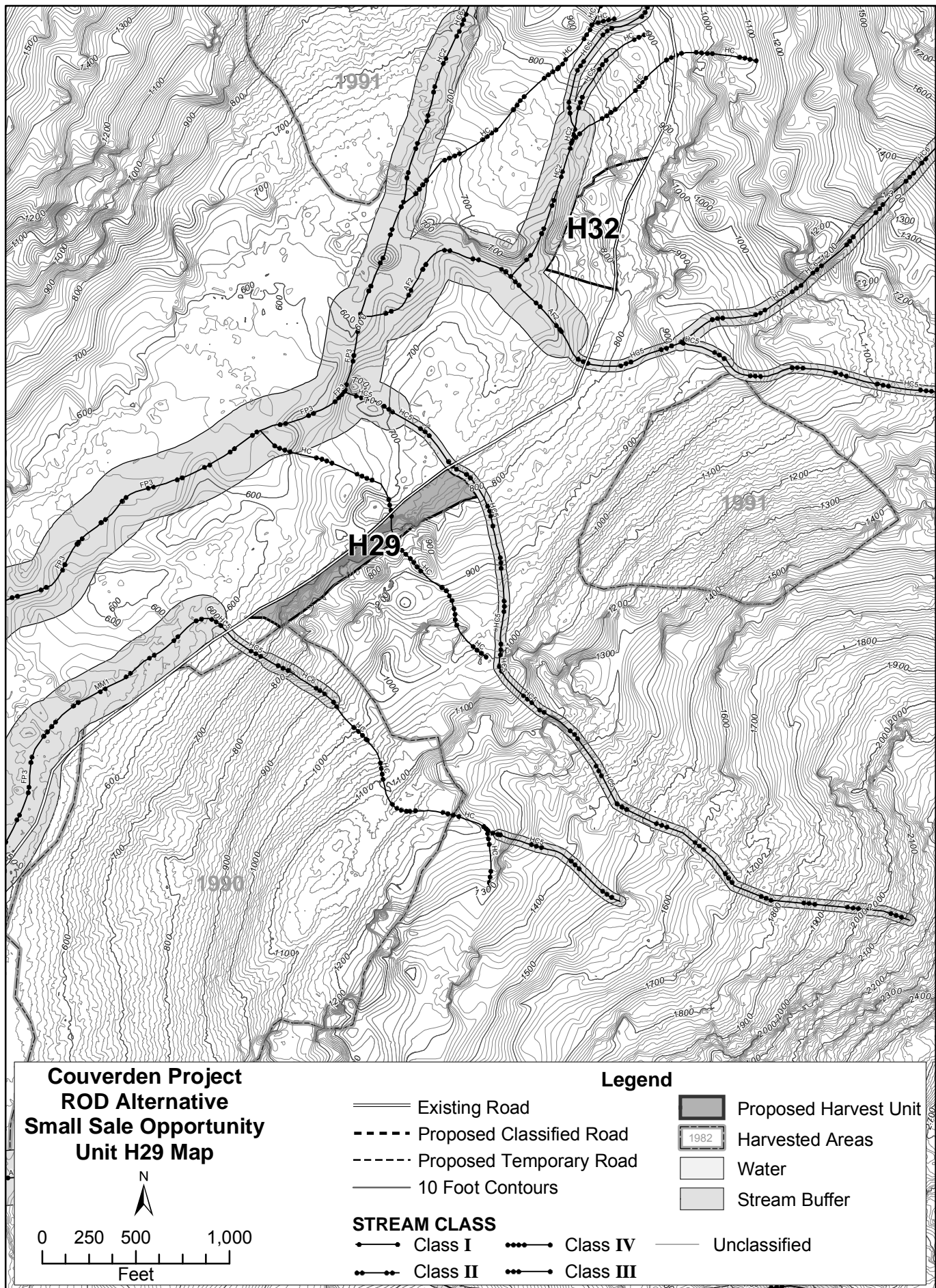
Mitigation:

Other Resources/Issues

Concern: None

Mitigation:

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COUVERDEN TIMBER SALE(S) - UNIT CARD Unit No. H29 Small Sale Opportunity

Harvest Method: Short skyline (cable)

Total Acres: 4 Total Volume: 94 MBF Volume per Acre: 27 MBF

UNIT DEVELOPMENT

This unit consists of Setting A of ROD Unit H29 and is designed to meet the small sale opportunity. Unit boundary was modified to include suitable timber within 500 feet of Road 8561. The following mitigation measures were either taken into account during unit design, or they will be applied during project implementation: F1, F2, F3, T1, W1, and W7.

Logging and Transportation: The timber can be yarded downhill using a short skyline system using the Road 8561 as continuous roadside landings. Harvest within 500 feet of the road. Tail trees are required. Class III stream, along the northeastern boundary, will require directional felling away from slope break buffer (BMP 12.6(a), 13.16). The Class IV stream within the unit will be split yarded and partial suspension can be achieved. Windthrow is not expected to be a problem after harvest.

Classified Roads: No new classified roads will be needed to access the unit. Except for 0.8 mile of the 8550 road, existing roads will remain open and would be available for OHV use.

Temporary Roads: No new temporary roads will be needed to access the unit.

Stand Management Objectives: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Treatment: Clearcut with reserve trees. Feather reserve trees along Class III stream to provide a windfirm buffer. This prescription would optimize the regeneration potential for fiber production, (especially for spruce), reduce mistletoe, and would be the most economical harvest method. The prescription is appropriate to meet wildlife, watershed, and other resource objectives

Regeneration Method: T1. Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

Possible Future Treatments: Possible planting if natural regeneration does not result in fully stocked stand or to increase species diversity, release, and pre-commercial thinning. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old-growth trees in original harvest, plus enough large second-growth trees to meet the 10% reserve requirement.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: The unit is bordered to the northeast by a Class III stream and bisected by a Class IV stream. A Class III/IV stream lies about 150 feet south of the unit in a clear cut. Based on electrofishing, the northeast stream contains Dolly Varden about 500 feet downstream of the unit. The south stream, based on visual observations, also has fish about 300 feet from the unit. The northeast stream has steep sideslopes (80%) near the unit bottom that could become unstable if disturbed.

Mitigation: F1. Class III stream: no programmed harvest within V-notch or to the sideslope break of the channel, whichever is greater, and manage the area beyond (approximately one site-potential tree height, about 120 feet) for reasonable assurance of windfirmness. F2, F3. The Class IV channel within the unit may require directional felling, splitline, partial, or full suspension.

Soils/Wetlands/Karst

Concern: None.

Mitigation:

Wildlife

Concern: Medium- and high-value marten habitat was identified in north end of unit. Black bear was visually observed in unit. Class III streams frame this unit.

Mitigation: W1, W7. Leave live reserve trees, large culls, and snags where possible to maintain habitat structure and snag density throughout, especially along streams on the north and west boundaries. Concentrate leave trees around large culls and snags to ensure windfirmness.

Record of Decision

Visual/Recreation

Concern: Meet the maximum modification VQO. No noticeable amount of the harvested area would be visible from Visual Priority Routes and Use areas or selected KVAs.

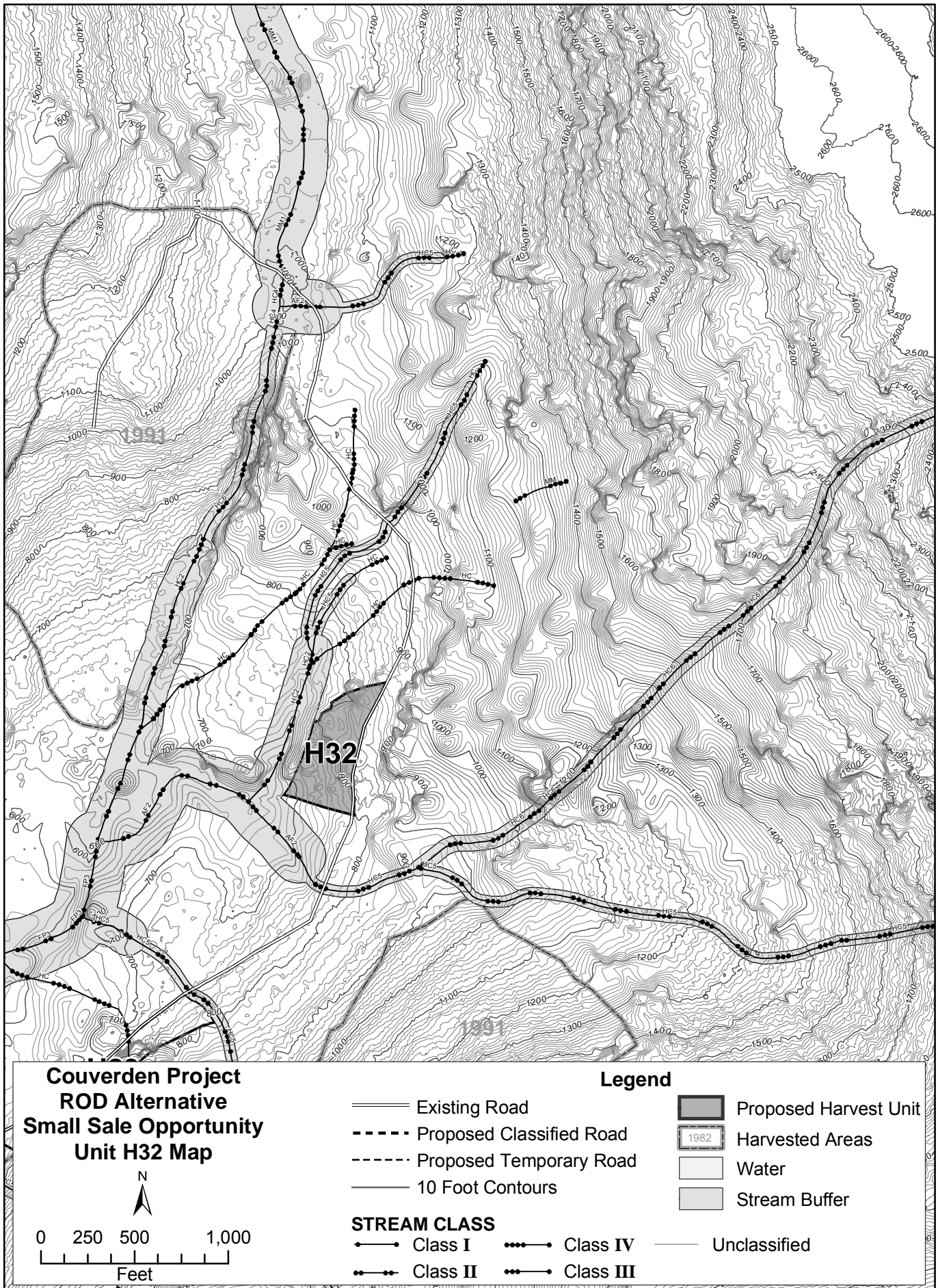
Mitigation: V1. Reserve trees would be concentrated in visible areas and steep areas to reduce visual contrast. V7. Leave most non-merchantable trees to help reduce visual contrast.

Other Resources/Issues

Concern: None.

Mitigation:

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COUVERDEN TIMBER SALE(S) - UNIT CARD Unit No. H32 Small Sale Opportunity

Harvest Method: Short Skyline (cable)

Total Acres: 4 Total Volume: 193 MBF Volume per Acre: 51 MBF

UNIT DEVELOPMENT

This unit consists of the southwest corner of ROD Unit H32 and was designed meet the small sale opportunity. Only areas within 500 feet of Road 8561 are included in the unit. The following mitigation measures were either taken into account during unit design, or they will be applied during project implementation: F1, F2, F3, F14, T1, W1, W7, and T1.

Logging and Transportation: The unit will be yarded using short skyline system using Road 8561 as continuous roadside landings. Tail holds will be out of the unit. Class II streams along the western and southern boundaries of the unit will require directional felling away from slope break buffers (BMP 12.6(a), 13.16).

Classified Roads: No new classified roads will be needed to access the unit. Except for 0.8 mile of the 8550 road, existing roads will remain open and would be available for OHV use.

Temporary Roads: No temporary roads will be needed to access the unit.

Stand Management Objectives: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Treatment: Clearcut with reserve trees. Reserve trees left in addition to stream buffers should form a 50- to 100-foot feathered-edge to improve windfirmness. This prescription would optimize the regeneration potential for fiber production (especially for spruce), reduce mistletoe, and would be the most economical harvest method. The prescription is appropriate to meet wildlife, watershed, and other resource objectives.

Regeneration Method: T1. Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

Possible Future Treatments: Possible planting if natural regeneration does not result in fully stocked stand or to increase species diversity, release, and pre-commercial thinning. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old-growth trees in original harvest, plus enough large second-growth trees to meet the 10% reserve requirement.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: A Class II stream bounds the unit on the west and changes to several branches of Class III and IV channels north of the unit. A Class II alluvial fan stream to the south extends to the southwest unit corner before a falls limits upstream fish passage.

Mitigation: F1. For the small area of Class II stream adjacent to the unit, allow no commercial harvest within 100 feet of the channel. For the Class II alluvial fan channel in the south allow no commercial harvest within 100 feet of the channel. No programmed commercial harvest within the active portion of the alluvial fan or 140 feet (the height of one site-potential tree), whichever is greater. Take no more than 10% of the remaining trees within the fan, leaving large trees for future stream channel recruitment.

Soils/Wetlands/Karst

Concern: None.

Mitigation:

Wildlife

Concern: One of the higher elevation units. The unit contains high value of the marten habitat. Wildlife travel corridors were documented throughout the unit, with moose and black bear visually observed in the unit. Previous harvests to the northwest and south may have impacted dispersal/travel corridors between alpine and lower elevational habitat.

Mitigation: W1, W7. Leave live reserve trees, large culls, and snags where possible to maintain habitat structure and snag density. Concentrate leave trees around stream buffers, culls, and snags to ensure windfirmness.

Visual/Recreation

Concern: Meet the maximum modification VQO. No parts of the harvested unit would be visible from Visual Priority Routes and Use areas or selected KVAs.

Mitigation:

Record of Decision

Other Resources/Issues

Concern: None

Mitigation:

Selected Alternative Road Cards

Road Management Objectives

Purpose and Use

The road management objectives (RMOs) presented here establish the intended purpose, and display design, maintenance, and operation criteria (as per FSH 7709.55) for each road in the project area. The information on the RMO form is part of a permanent database that can be updated as access needs, issues, and budgets change. Proposed new roads and existing roads with planned reconstruction or maintenance have a second section with site-specific design criteria that will be used during design, construction, and initial monitoring of any road work proposed in this document. For proposed new roads, a map is also included showing the proposed road location and identification of areas discussed in the site-specific design criteria.

General Design Criteria

The general design criteria provide various descriptors of the type of road, and the intended purpose and future use of the road. From this information, the maintenance and operation criteria can be developed. This information is critical for determining whether a U.S. Army Corps of Engineers' permit will be required for segments of road crossing wetlands. Roads built solely for silvicultural purposes do not require these permits.

Maintenance Criteria

The maintenance criteria include a discussion of how the road is to be maintained, centering on the following three strategies:

- **Active:** provide frequent cleanout of ditches and catch basins to ensure controlled drainage. Control roadside brush to maintain sight distance. Grade as needed to maintain crown and running surface.
- **Storm Proof:** provide water bars, rolling dips, out sloping, etc., to ensure controlled runoff until any needed maintenance can be performed on the primary drainage system. Control roadside brush to maintain passage.
- **Storage:** remove or bypass all drainage structures to restore natural drainage patterns, add water bars as needed to control runoff, and revegetate.

The *active* maintenance strategy is applied to roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities. These roads are assigned Maintenance Level 3. The active maintenance strategy will also at times be applied to roads intended only for use by high clearance vehicles, or Maintenance Level 2 roads. This will usually be the case when log haul is expected in the near future.

An intermediate maintenance strategy is to *storm proof*, or stabilize, the road by providing drivable water bars, and out sloping to control runoff in case the primary drainage system of culverts and ditches is overwhelmed during a storm event. Each culvert will be evaluated as to where the water would go if the culvert were to fail to carry the high flow. A water bar or out slope at this location will minimize the potential of erosion of long

Record of Decision

stretches of ditch line or roadway. This is intended to be the primary maintenance strategy applied to roads assigned Maintenance Level 2.

Storage is intended to be the primary maintenance strategy on intermittent use roads during their closure cycle. Road storage is defined in FSH 5409.17 as “the process/action of closing a road to vehicle traffic and placing it in a condition that requires minimum maintenance to protect the environment and preserve the facility for future use.” In this strategy, bridges and culverts on streams are generally removed to restore natural drainage patterns. Cross drains and ditch relief culverts will be bypassed with deep water bars but may be left in place to minimize the cost of re-using these roads in the future. Roads in storage are left in a self-maintaining state in order to use more road maintenance funds on the open drivable roads. Closure and basic custodial maintenance is considered Maintenance Level 1.

The interdisciplinary team went through a process to define road management considerations, leading to a maintenance strategy for the project area. The work needed to meet the objectives can be accomplished on the roads along the haul route in these timber sales. Work needed on other roads to meet the desired objective will be scheduled as funding allows.

Operation Criteria

The operation criteria include a presentation of each of the five traffic management strategies identified in FSM 7731 (encourage, accept, discourage, prohibit, and eliminate) to be applied to different traffic classes on each road. The traffic management narrative describes what actions will be taken in order to apply each strategy. For example, if the strategy “eliminate” is prescribed for standard passenger and high clearance vehicles, the narrative describes the method to accomplish this, such as removal of stream crossing structures, gating, etc.

Site-Specific Design Criteria

The site-specific design criteria include road location objectives, wetland information, erosion control and rock pit BMPs, and any stream crossing data. The road location discussion documents why the road is proposed in a specific location, control points, and alternative routes considered (if any). A main location objective is to avoid crossing wetlands. At times, however, it is necessary to cross wetlands in order to minimize the total impact of a road. These areas are discussed, documenting areas of mapped wetlands and why the road is located across these areas. All fish streams are identified, as well as non-fish streams with sufficient flow to require a 48-inch or larger culvert. The stream crossing information describes the stream in enough detail to lead to a preliminary crossing structure recommendation and to evaluate the adequacy of the proposed structure.

Road Definitions Temporary, Decommissioned, and Unclassified

Temporary roads are authorized by contract, permit, lease, other written authorization, or emergency operation, not intended to be a part of the forest transportation system and not necessary for long-term resource management. A common example of a temporary road found in the Couverden project area is a road leading to a landing inside of a harvested unit. Temporary roads may be up to a mile in length, but are generally less than 0.5 mile long.

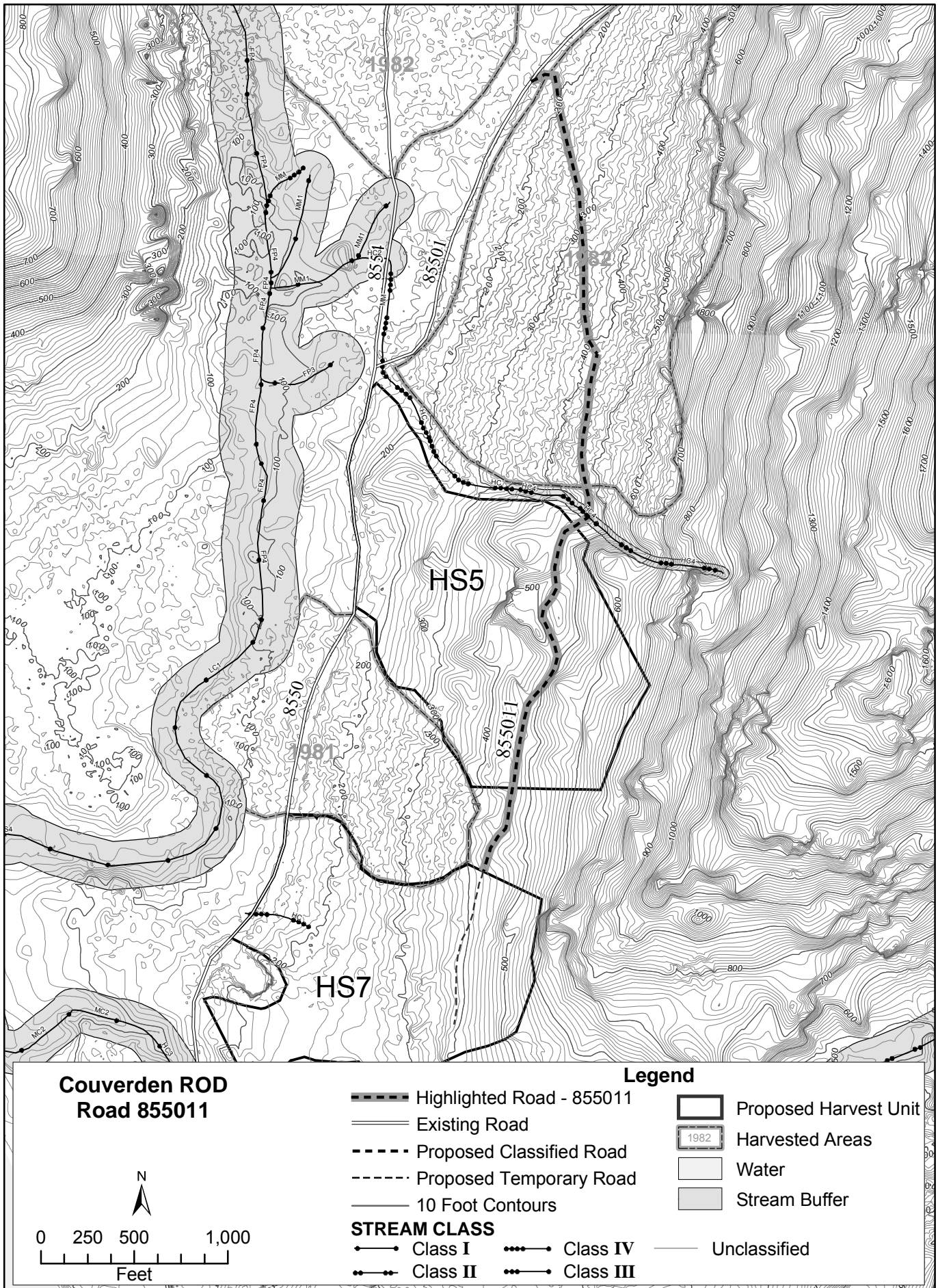
Obliterated roads are unneeded roads that have been stabilized and restored to a more natural state. Obliterating includes re-establishing former drainage patterns, stabilizing slopes, and restoring vegetation. Culverts and bridges are bypassed or removed, water bars are added, and the road entrance is generally blocked to motorized traffic. The temporary road mentioned above would normally be obliterated after the timber was removed from the harvest unit and the log trucks were finished hauling the timber to a LTF.

Unclassified roads are roads not managed as part of the forest transportation system, such as unplanned roads, abandoned travelways, and off-road vehicle tracks that have not been designated and managed as a trail. Unclassified roads also include those roads that were once under permit or other authorization and were not obliterated upon the termination of the authorization. An example of an unclassified road is the temporary road mentioned above that was not obliterated after it was no longer needed. Once the road was not obliterated after its authorized use terminated (the timber sale), it became an unclassified road.

Glossary for RMO Form Values

Project	The name of the project or NEPA document that addresses the environmental impacts of this road.
Land Use Designation	SV = Scenic Viewshed; ML = Modified Landscape SA = Special Interest Area; OG = Old-growth Habitat Reserve TM = Timber Management
Route Number	Normally only long-term Forest Development Roads are assigned road numbers.
Route Name	All long-term roads assigned numbers will be given names.
Termini	The beginning and ending location of the road usually measured by milepost (MP). Shown on the road cards as Bmp, beginning milepost, and Emp, ending milepost.
Length (miles)	Best estimate of the length of road.
Functional Class	Arterial (A) = primary; Collector (C) = secondary; or Local (L) = tertiary.
Service Life	Short-term (less than 10 years) or Long-term. Long-term used in conjunction with Entry Cycle to be Long-term Constant (LC) or Long-term Intermittent (LI).
Width (ft)	Travelway, width of road; 14 foot and 16 foot are normal values.
Design Speed (mph)	10, 20, or 30 mph.
Critical Vehicle	The largest vehicle (by weight, size, or unique shape) whose limited use on the road is necessary to complete the planned activity.
Design Vehicle	The vehicle frequently using the road that determines the minimum standard for a particular design element: passenger car, pick-up, log truck, lowboy, rock truck, or yarding equipment.
Intended Purpose	Brief description of why this road is needed.
Maintenance Levels Operational (Current Condition) Objective (Desired Future Condition)	Levels 1 through 5: Level 1 - Closed, basic drainage maintenance; Level 2 - High Clearance Vehicles; Level 3 - All Vehicles, low user comfort; Level 4 - All Vehicles, moderate user comfort; Level 5 - All Vehicles, high user comfort.
Alaska Forest Practices Act Class	Road status as specified by the Alaska Forest Resources and Practices Regulations, 1993: Active, Inactive, or Closed.
Highway Safety Act	Road open to general public without restrictive gates, prohibitive signs, or regulation other than restrictions based on size, weight, or class of registration: yes or no.
Travel Management Strategy	Several values apply—see the Travelway Classification/Operation Guide. Lists classes of traffic that will be encouraged, accepted, discouraged, prohibited, or eliminated.

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ROAD MANAGEMENT OBJECTIVES

Couverden Project – Road 855011

<u>Road Description/Location</u>			
Project/EIS	System	Land Use Designation	
Couverden	Couverden	TM	
Route No.	Route Name	Status	
855011		New Construction	
Begin M.P.	Length(miles)	Begin Terminus	End Terminus
0.00	0.96	Jct with Rd 85501 at MP 0.36	Northern boundary of HS7

<u>General Design Criteria and Elements</u>							
Functional Class	Service Life	Traffic Service Level	Surface	Width	Critical Vehicle	Design Vehicle	Design Speed
Local	LI	D	Shot rock	14'	Low boy	Logging truck	10 mph
Intended Purpose/Future Use:							
Access for silvicultural activities. Close road after harvest to minimize wildlife disturbance and reduce maintenance needs. The road will be placed in a storage condition after use. Roads in storage are not considered usable by normal vehicle traffic. (Note: Except for 0.8 mile of the 8550 road, existing roads will remain open and would be available for OHV use.)							

<u>Maintenance Criteria</u>			
Operational Maintenance Level	2	Objective Maintenance Level	1
(Planned Initial Condition)		(Desired Future Condition)	
Maintenance Narrative:			
AFR&P Regs. “active” status: Keep culverts, catchbasins, ditches and road blocks functional. Grade as needed to maintain crown and running surface. Control roadside brush to maintain sight distance (MP 0.00 – 0.96)			
Storage AFR&P Regs. “closed” status: Place road in storage, MP 0.00 – 0.96, remove or bypass culverts, add waterbars as needed.			

<u>Operation Criteria</u>	
Highway Safety Act: No	Jurisdiction: National Forest ownership
Travel Management Strategies	
Encourage:	N/A
Accept:	Hikers after timber harvest.
Discourage:	Mountain bikes after timber harvest.
Prohibit:	Public traffic during timber harvest. Motor vehicles after timber harvest.
Eliminate:	N/A

Record of Decision

Travel Management Narrative:

Maintenance Level 1: While the road is at this maintenance level, the road will be closed and access for motor vehicles will be blocked by placing a closing device at the beginning of Road 855011. Mountain bike usage on this road will be discouraged by signing.

Maintenance Level 2: While the road is at this maintenance level, it is open to high clearance highway vehicles and non-highway vehicles. Public travel on this isolated road system is expected to be very low. Administrative traffic for post-sale silvicultural purpose and road maintenance are expected to generate most of the traffic on the system.

District Ranger Approval (signature) _____

Pete Griffin

Date: 6-28-05

Site Specific Design Criteria

Road Segment Description

Milepost (miles)	Grade (%)	Average Side-slopes (%)	Length (feet)	Comments
0.00 to 0.36	-10-15a	30-40	1650	Unclassified road requires extensive brushing, replacement of culverts, and re-rocking.
0.36 to 0.50	10-12f	30-50	750	Unclassified road ends, beginning of new construction, thick vegetation. Easy to moderate construction.
0.50 to 0.53	-10a-12f	30-60	170	Begin end-hauling at MP 0.50, end end-hauling at MP 0.67. Difficult construction.
0.53 to 0.58	10-12f	20-40	280	This segment contains a Class III V-notch crossing at boundary of Unit HS5, 4-8ft channel width, requiring 48" pipe, 20' fill at MP 0.54. Moderate construction.
0.58 to 0.83	0-10f	30-40	1303	MP 0.83 (HS5 unit boundary) easy construction.
0.83 to 0.96	10-12a	20-40	661	MP 0.85 begin through cut, MP 0.89 end cut. MP 0.96 end classified road, good landing location on bench.

*a = adverse; f = favorable

Stream Crossing: MP 0.54 (05S1-2) Class III, HC4 channel type, 48" culvert, 20' fill needed, stream gradient 38%, cobble substrate, high debris jam potential. A log stringer bridge or culvert will be installed.

Wetlands: None noted.

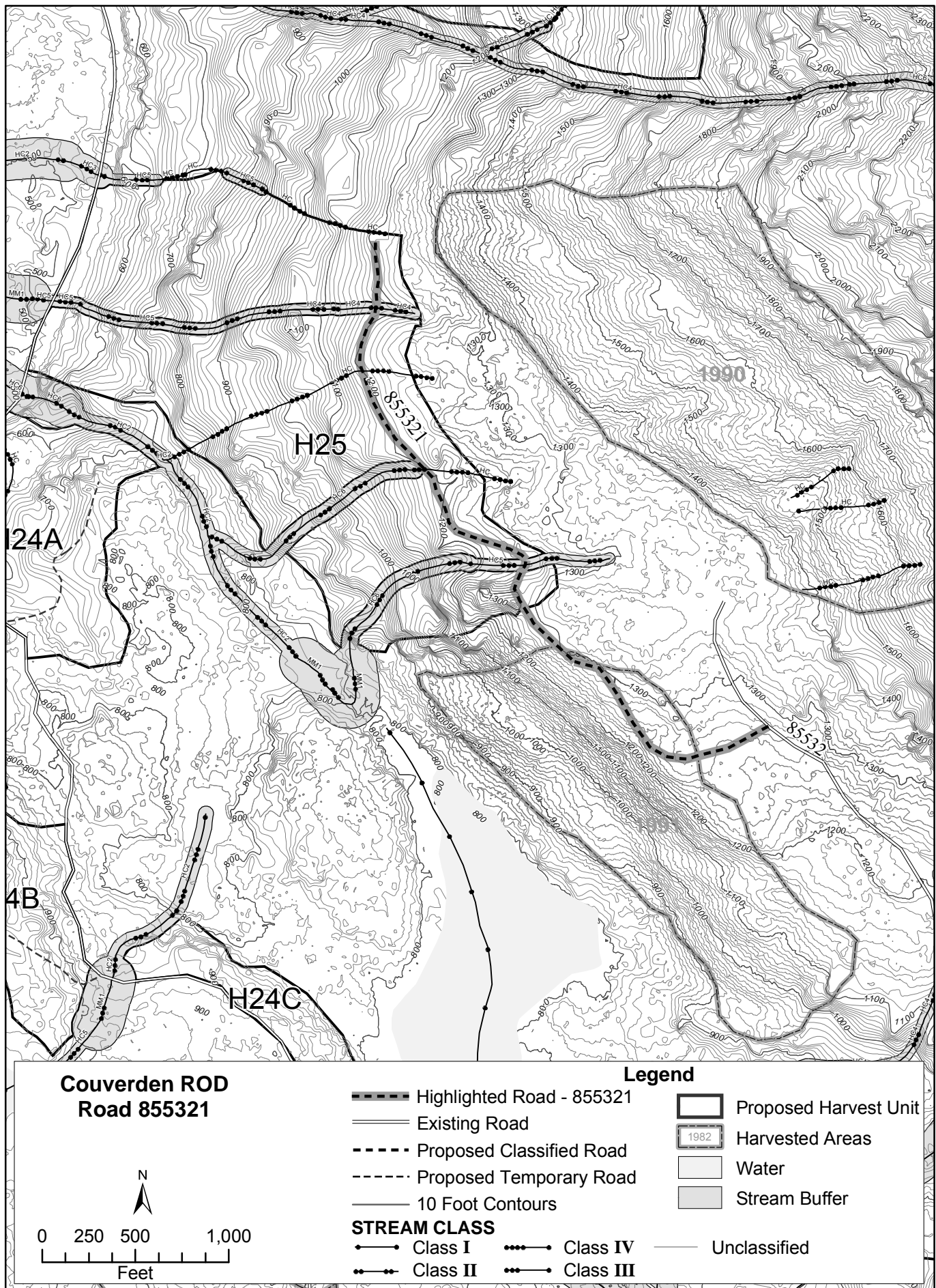
Erosion Control: An erosion control plan for road construction and maintenance will be developed according to standard project specifications (BMP 14.5). All areas of organic or mineral soil exposed during construction shall be grass seeded (with native species if possible) and fertilized (BMP 12.17, 14.8).

Rock Pits: During periods of high rainfall (as defined in current regional specifications), blasting operations will be suspended at quarries near potentially unstable sites where ground vibration may induce mass movements (BMP 14.6). Rock pits will require site specific erosion control plans (BMP 14.18). This road crosses areas of visual concern and therefore attention to visual effects will be necessary when selecting location, size, and layout of a rock pit along this road. Sites noted as potential rock pit are listed below:

None noted along this road. Can use rock pit near MP 1.576 on Road 8550.

Summary of Mitigation: The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: W9, R1. These measures are described within the resource section that apply.

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ROAD MANAGEMENT OBJECTIVES

Couverden Project – Road 855321

<u>Road Description/Location</u>			
Project/EIS	System	Land Use Designation	
Couverden	Couverden	TM	
Route No.	Route Name	Status	
855321		New Construction	
Begin M.P.	Length(miles)	Begin Terminus	End Terminus
0.00	0.86	Jct with 85532 Rd at MP 0.974	Last landing in unit H25

<u>General Design Criteria and Elements</u>							
Functional Class	Service Life	Traffic Service Level	Surface	Width	Critical Vehicle	Design Vehicle	Design Speed
Local	LI	D	Shot rock	14'	Low boy	Logging truck	10 mph
Intended Purpose/Future Use:							
Access for silvicultural activities. Close road after harvest to minimize wildlife disturbance and reduce maintenance needs. The road will be placed in a storage condition after use. Roads in storage are not considered usable by normal vehicle traffic. (Note: Except for 0.8 mile of the 8550 road, existing roads will remain open and would be available for OHV use.)							

<u>Maintenance Criteria</u>			
Operational Maintenance Level	2	Objective Maintenance Level	1
(Planned Initial Condition)		(Desired Future Condition)	
Maintenance Narrative:			
AFR&P Regs. “active” status: Keep culverts, catchbasins, ditches, and roadblocks functional. Grade as needed to maintain crown and running surface. Control roadside brush to maintain sight distance (MP 0.00 – 0.86).			

<u>Operation Criteria</u>	
Highway Safety Act:	No
Jurisdiction:	National Forest ownership
Travel Management Strategies:	
Encourage:	N/A
Accept:	Hikers after timber harvest.
Discourage:	Mountain bikes after timber harvest
Prohibit:	Motor vehicles after timber harvest.
Eliminate:	N/A

Record of Decision

Travel Management Narrative:

Maintenance Level 1: While the road is at this maintenance level, the road will be closed and access for motorized highway vehicles will be blocked by placing a closing device at the beginning of Road 855321. Mountain bike usage on this road will be discouraged by signing.

Maintenance Level 2: While the road is at this maintenance level, it is open to high clearance highway vehicles and non-highway vehicles. Public travel on this isolated road system is expected to be very low. Administrative traffic for post-sale silvicultural purpose and road maintenance is expected to generate most of the traffic on the system.

District Ranger Approval (signature) _____

Pete Duffin

Date: 6-28-05

Site Specific Design Criteria Road Segment Description

Milepost (miles)	Grade (%)	Average Side-slopes (%)	Length (feet)	Comments
0.00 to 0.25	-5-10f	10-20	1,324	Existing temp road, extensive brushing required, and minimal re-rocking.
0.25 to 0.39	0-14a	20-50	750	Begin new construction, this section contains 200 ft section of full bench construction. MP 0.14 landing "A" moderate to difficult construction.
0.39 to 0.55	-5a – 15a	30-50	850	This segment contains a Class III crossing at MP 0.42, 4 to 8 ft channel width (3 to 4 ft downstream on steeper slopes), requiring 60-inch pipe. MP 0.55 is landing "B". Moderate construction.
0.55 to 0.66	-8f-12a	30-60	620	This segment contains a Class III crossing at MP 0.58, 5 ft channel width at crossing site, requiring 60-inch pipe. MP 0.66 is landing "C". Moderate to difficult construction.
0.66 to 0.73	-12a-12f	20-40	370	This segment contains a Class IV crossing at MP 0.70, 4 ft. channel width (<2 ft downstream on steeper slopes), requiring 48-inch pipe. MP 0.73 is landing "D". Moderate construction.
0.73 to 0.86	0-10f	30-40	630	This segment contains Class III and IV crossings at MP 0.79 and 0.84, 3 to 4 ft channel width on III and 1 ft channel width on IV. Crossings require 48-inch and 24-inch pipes. End of Road is Landing "E".

*a = adverse; f= favorable

Stream Crossing: MP 0.42 Class III, HC5 channel type, 60-inch culvert, cobble/gravel substrate, stream gradient is 15%, moderate debris jam potential.

MP 0.58 Class III/IV transition location, HC6 below and HC above crossing for channel type, 60-inch culvert, cobble, 12% gradient at crossing but 55% just below for channel gradient, low to moderate debris jam potential.

MP 0.70 Class IV, HC channel type, 48-inch culvert, cobble, gradient, low debris jam potential.

MP 0.79 Class III, HC4 channel type, 48-inch culvert, cobble/gravel, 20% gradient, high debris jam potential.

MP 0.84 Class IV, HC channel type, 24-inch culvert, gravel, 45% stream channel gradient, low debris jam potential.

Wetlands: None noted.

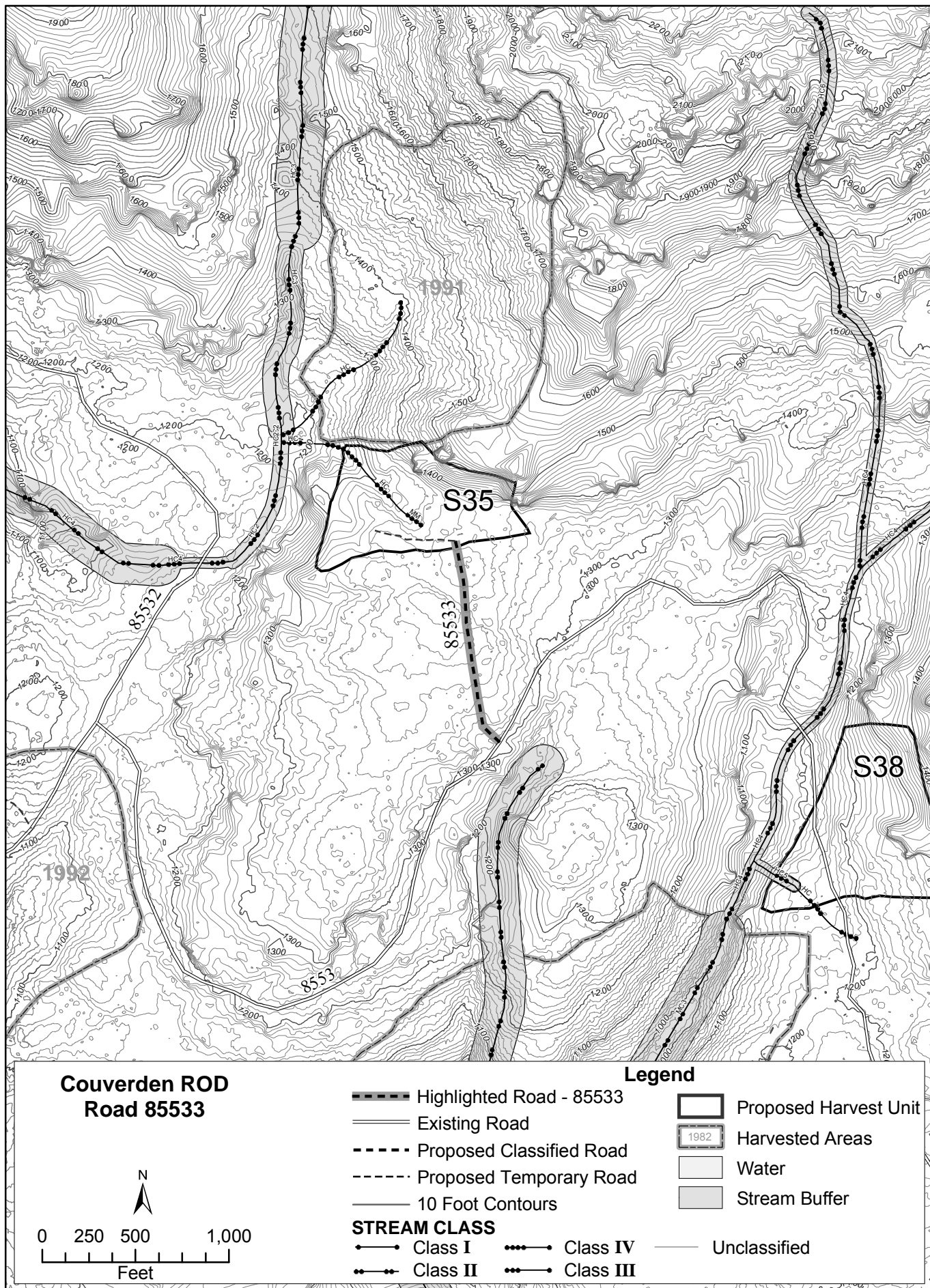
Erosion Control: An erosion control plan for road construction and maintenance will be developed according to standard project specifications (BMP 14.5). All areas of organic or mineral soil exposed during construction shall be grass seeded (with native species if possible) and fertilized (BMP 12.17, 14.8).

Noted areas of concern: MP 0.25-0.39 contains a 200 ft section of full bench construction.

Rock Pits: During periods of high rainfall (as defined in current regional specifications), blasting operations will be suspended at quarries near potentially unstable sites where ground vibration may induce mass movements (BMP 14.6). Rock pits will require site-specific erosion control plans (BMP 14.18). This road crosses areas of visual concern and therefore attention to visual effects will be necessary when selecting location, size, and layout of a rock pit along this road. Sites noted as potential rock pit are listed below:

None noted along this road. Can use rock pit near MP 6.163 or 7.608 on Road 8553.

Summary of Mitigation: The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F9, W9, R1. These measures are described within the resource section that apply.



ROAD MANAGEMENT OBJECTIVES

Couverden Project- Road 85533

<u>Road Description/Location</u>			
Project/EIS	System	Land Use Designation	
Couverden	Couverden	TM	
Route No.	Route Name	Status	
85533		New Construction	
Begin M.P.	Length(miles)	Begin Terminus	End Terminus
0.00	0.21	MP 7.86 of the 8553 Road	MP 0.21

<u>General Design Criteria and Elements</u>							
Functional Class	Service Life	Traffic Service			Critical Vehicle	Design Vehicle	Design Speed
		Level	Surface	Width			
Local	LI	D	Shot rock	14'	Low boy	Logging truck	10 mph
Intended Purpose/Future Use:							
Access for silvicultural activities. Close road after harvest to minimize wildlife disturbance and reduce maintenance needs. The road will be placed in a storage condition after use. Roads in storage are not considered usable by normal vehicle traffic. (Note: Except for 0.8 mile of the 8550 road, existing roads will remain open and would be available for OHV use.)							

<u>Maintenance Criteria</u>			
Operational Maintenance Level 2		Objective Maintenance Level 1	
(Planned Initial Condition)		(Desired Future Condition)	
Maintenance Narrative:			
AFR&P Regs. “active” status: Keep culverts, catchbasins, ditches, and road blocks functional. Grade as needed to maintain crown and running surface. Control roadside brush to maintain sight distance (MP 0.00 – 0.21).			
Storage AFR&P Regs. “closed” status: Place road in storage, MP 0.00 – 0.21, remove or bypass culverts, add waterbars as needed.			

<u>Operation Criteria</u>	
Highway Safety Act:	No
Jurisdiction:	National Forest ownership
Travel Management Strategies	
Encourage:	N/A
Accept:	Hikers after timber harvest.
Discourage:	Mountain bikes after timber harvest.
Prohibit:	Public traffic during timber harvest. Motor vehicles after timber harvest.
Eliminate:	N/A

Record of Decision

Travel Management Narrative:

Maintenance Level 1: While the road is at this maintenance level the road will be closed and access for motorized highway vehicles will be blocked by placing a closing device at the beginning of Road 85533. Mountain bike usage on this road will be discouraged by signing.

Maintenance Level 2: While the road is at this maintenance level, it is open to high clearance highway vehicles and non-highway vehicles. Public travel on this isolated road system is expected to be very low. Administrative traffic for post-sale silvicultural purpose and road maintenance is expected to generate most of the traffic on the system.

District Ranger Approval (signature) _____

Pete Giffin

Date: 6-28-05

Site-Specific Design Criteria

Road Segment Description

Milepost (miles)	Grade (%)	Average Side-slopes (%)	Length (feet)	Comments
0.00 to 0.21	0 to 18f	5-20	1,130	Unclassified road requires brushing, removal of water bars, ditch, add cross drainpipes, grading and additional rock as needed.

*a = adverse; f = favorable

Stream Crossing: None.

Wetlands: Road crosses wetlands for a distance of approximately 800 feet. Chose this location to utilize existing temporary roadbed. Cross drains will be required to allow flow of water under road grade (BMP 12.5).

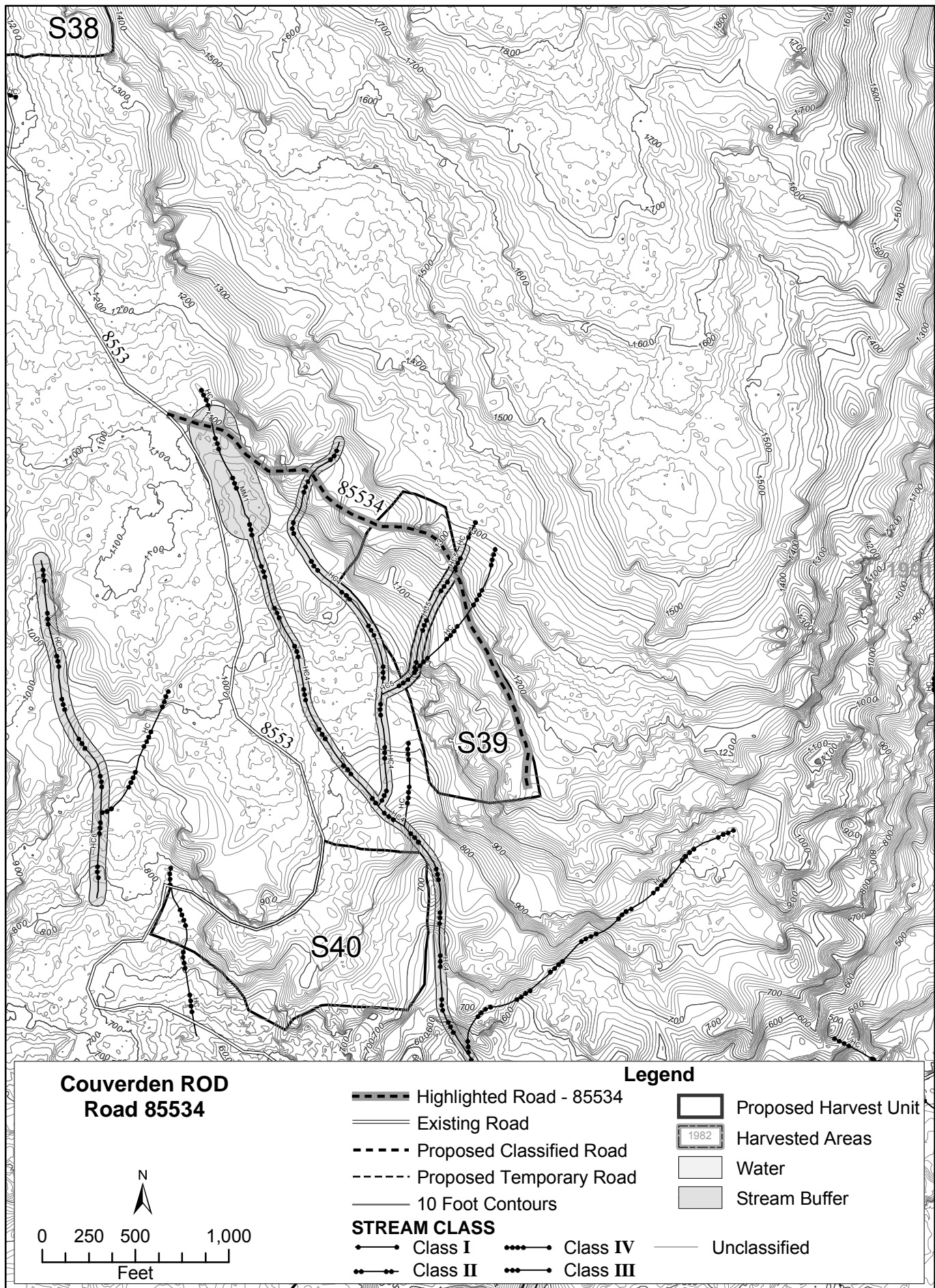
Erosion Control: An erosion control plan for road construction and maintenance will be developed according to standard project specifications (BMP 14.5). All areas of organic or mineral soil exposed during construction shall be grass seeded (with native species if possible) and fertilized (BMP 12.17, 14.8).

Rock Pits: During periods of high rainfall (as defined in current regional specifications), blasting operations will be suspended at quarries near potentially unstable sites where ground vibration may induce mass movements (BMP 14.6). Rock pits will require site-specific erosion control plans (BMP 14.18). This road travels through areas of visual concern and therefore attention to visual effects will be necessary when selecting location, size, and layout of a rock pit along this road. Sites noted as potential rock pit are listed below:

None noted along this road. Can use rock pit near MP 7.608 on Road 8553.

Summary of Mitigation: The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: W9. These measures are described within the resource sections that apply.

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ROAD MANAGEMENT OBJECTIVES

Couverden Project – Road 85534

<u>Road Description/Location</u>			
Project/EIS	System	Land Use Designation	
Couverden	Couverden	TM	
Route No.	Route Name	Status	
85534		New Construction	
Begin M.P.	Length(miles)	Begin Terminus	End Terminus
0.00	0.6	At MP 9.198 on Rd 8553	Last landing in Unit S-39

<u>General Design Criteria and Elements</u>							
Functional Class	Service Life	Traffic Service Level	Surface	Width	Critical Vehicle	Design Vehicle	Design Speed
Local	LI	D	Shot rock	14'	Low boy	Logging Truck	10 mph
Intended Purpose/Future Use							
Access for silvicultural activities. Close road after harvest to minimize wildlife disturbance and reduce maintenance needs. The road will be placed in a storage condition after use. Roads in storage are not considered usable by normal vehicle traffic. (Note: Except for 0.8 mile of the 8550 road, existing roads will remain open and would be available for OHV use.)							

<u>Maintenance Criteria</u>			
Operational Maintenance Level	2	Objective Maintenance Level	1
(Active sale)		(Post sale)	
Maintenance Narrative:			
AFR&P Regs. “active” status: Keep culverts, catchbasins, ditches, and road blocks functional. Grade as needed to maintain crown and running surface. Control roadside brush to maintain sight distance (MP 0.00 – 0.36).			

<u>Operation Criteria</u>	
Highway Safety Act: No	Jurisdiction: National Forest ownership
Travel Management Strategies	
Encourage:	N/A
Accept:	Hikers after timber harvest.
Discourage:	Mountain bikes after harvest.
Prohibit:	Motor vehicles after timber harvest.
Eliminate:	N/A

Record of Decision

Travel Management Narrative:

Maintenance Level 1: While the road is at this maintenance level, the road will be closed and access for motorized highway vehicles will be blocked by placing a closing device at the beginning of Road 85534. Mountain bike usage on this road will be discouraged by signing.

Maintenance Level 2: While the road is at this maintenance level, it is open to high clearance highway vehicles and non-highway vehicles. Public travel on this isolated road system is expected to be very low. Administrative traffic for post-sale silvicultural purpose and road maintenance is expected to generate most of the traffic on the system.

District Ranger Approval (signature)

Pete Griffin

Date: 6-28-05

Site Specific Design Criteria

Road Segment Description

Milepost (miles)	Grade (%)	Average Side-slopes (%)	Length (feet)	Comments
0.00 to 0.16	-5a-18f	20-50	850	This segment cross a Class IV stream at MP 0.04, 2-ft wide channel, requires a 30-inch pipe, some section of 18% favorable grade, MP 0.16 begin 16-ft cut. Easy construction.
0.16 to 0.25	10-20f	20-50	470	This segment contains a Class III crossing at MP 0.17, 9-ft- wide channel requiring 84-inch pipe, 16-ft fill, MP 0.25 enter unit S37. Difficult construction, 100 ft of full bench construction.
0.25 to 0.30	10-20f	30-40	280	Landing 1 at MP 0.30, a small section of 18% favorable grade, easy to moderate construction.
0.30 to 0.37	-5a-5	20-40	295	This segment cross a Class III stream at MP 0.35, 5-ft wide channel requiring a 60-inch pipe, easy construction.
0.37 to 0.6	-5a-10	20-40	1,214	This segment cross a Class IV stream at MP 0.39, requiring a 24-inch pipe, easy construction.

*a = adverse; f = favorable

Stream Crossings: MP 0.04 Class IV stream, HC channel type, 30-inch culvert, gravel substrate, stream gradient is 10%, low debris jam potential.

MP 0.17 Class III stream, HC5 channel type, 84-inch culvert, gravel/cobble substrate, stream gradient 40%, high debris jam potential.

MP 0.35 Class III stream, HC5 channel type, 60-inch culvert, cobble substrate, stream gradient 40%, high debris jam potential.

MP 0.39 Class IV stream, HC channel type, 24-inch culvert, gravel substrate, stream gradient 30%, moderate debris jam potential.

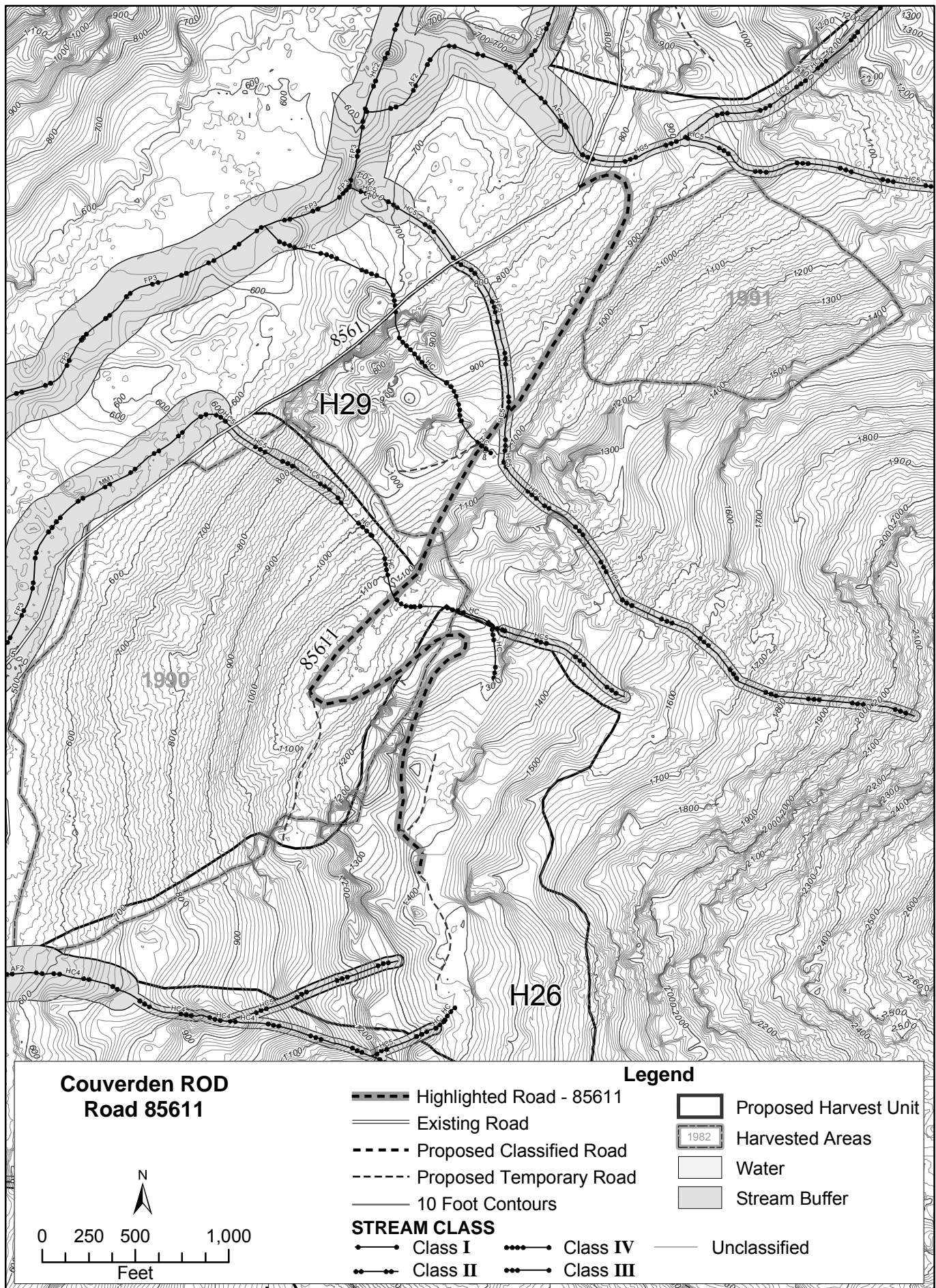
Wetlands: MP 0.00 to MP 0.12 - The road passes through a mosaic of many small wetlands (less than 1,000 sq. ft. each) and upland areas. All wetlands could not be totally avoided because the road was designed to reach the top of the unit and minimize the effect of the crossing to the V-notch Class III stream. Mitigation measure F10 and BMP 12.5 (Watershed Management – Wetland Identification, Evaluation, and Protection) would be followed to maintain wetland hydrology and minimize effects to the wetland functions. The small wetlands in this area primarily provide water storage and habitat diversity functions.

Erosion Control: An erosion control plan for road construction and maintenance will be developed according to standard project specifications (BMP 14.5). All areas of organic or mineral soil exposed during construction shall be grass seeded (with native species if possible) and fertilized (BMP 12.17, 14.8).

Noted area of concern: MP 0.16-0.25 contains a 100 ft section of full bench construction.

Rock Pits: During periods of high rainfall (as defined in current regional specifications), blasting operations will be suspended at quarries near potentially unstable sites where ground vibration may induce mass movements (BMP 14.6). Rock pits will require site-specific erosion control plans (BMP 14.18). This road travel through areas of visual concern and therefore attention to visual effects will be necessary when selecting location, size, and layout of a rock pit along this road. No potential rock pits were noted along this road. Use rock pit near MP 8.860 on Road 8553.

Summary of Mitigation: The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: W9, F8, F10, and R1. These measures are described within the applicable resource sections of the EIS.



ROAD MANAGEMENT OBJECTIVES

Couverden Project – Road 85611

<u>Road Description/Location</u>			
Project/EIS	System	Land Use Designation	
Couverden	Couverden	TM	
Route No.	Route Name	Status	
85611		New Construction	
Begin M.P.	Length(miles)	Begin Terminus	End Terminus
0.00	1.10	Jct with Road 8561 at MP 0.85	Last landing in unit H26

<u>General Design Criteria and Elements</u>							
Functional Class	Service Life	Traffic Service Level	Surface	Width	Critical Vehicle	Design Vehicle	Design Speed
Local	LI	D	Shot rock	14'	Low boy	Logging truck	14 mph
Intended Purpose/Future Use							
Access for silvicultural activities. Close road after harvest to minimize wildlife disturbance and reduce maintenance needs. The road will be placed in a storage condition after use. Roads in storage are not considered usable by normal vehicle traffic. (Note: Except for 0.8 mile of the 8550 road, existing roads will remain open and would be available for OHV use.)							

<u>Maintenance Criteria</u>			
Operational Maintenance Level	2	Objective Maintenance Level	1
(Active sale)		(Post sale)	
Maintenance Narrative:			
AFR&P Regs. “active” status: Keep culverts, catch basins, ditches, and road blocks functional. Grade as needed to maintain crown and running surface. Control roadside brush to maintain sight distance (MP 0.00 – 0.42).			
Storage AFR&P Regs. “closed” status: Place road in storage, MP 0.00 – 0.42, remove or bypass culverts, add waterbars as needed.			

<u>Operation Criteria</u>	
Highway Safety Act:	No
Jurisdiction:	National Forest ownership
Travel Management Strategies	
Encourage:	N/A
Accept:	Hikers after timber harvest.
Discourage:	Mountain bikes after timber harvest.
Prohibit:	Motor vehicles after timber harvest.
Eliminate:	N/A

Record of Decision

Travel Management Narrative:

Maintenance Level 1: While the road is at this maintenance level, the road will be closed and access for motorized highway vehicles will be blocked by placing a closing device at the beginning of Road 85611. Mountain bike usage on this road will be discouraged by signing.

Maintenance Level 2: While the road is at this maintenance level, it is open to high clearance highway vehicles and non-highway vehicles. Public travel on this isolated road system is expected to be very low. Administrative traffic for post-sale silvicultural purpose and road maintenance is expected to generate most of the traffic on the system.

District Ranger Approval (signature) Pete Griffin Date: 6-28-05

Site Specific Design Criteria Road Segment Description

Milepost (miles)	Grade (%)	Average Side-slopes (%)	Length (feet)	Comments
0.00 to 0.68	5-10a	20-50	3,607	Unclassified road requires extensive brushing and replacement of culverts.
0.68 to 0.82	-10-16	-5-55	744	Begin new construction. This section contains a short 200 ft full bench construction, good waste area for end haul material. MP 0.14 begin cut for 60' radius switchback.
0.82 to 0.87	10-15	-5-65	306	End cut for the switchback at MP 0.17, begin end haul at MP 0.19
0.87 to 0.97	18f	50-60	470	This section contains 18% favorable grade, heavy construction, stop end hauling at MP 0.29.
0.97 to 1.05	5-16	20-45	423	MP 0.32 landing location, MP 0.37 left spur.
1.05 to 1.10	16f	-5-20	270	End of road, large landing.

*a = adverse; f = favorable

Stream Crossing: No bridges, fish streams, or culverts ≥ 48 inches were noted.

Wetlands: None noted.

Erosion Control: An erosion control plan for road construction and maintenance will be developed according to standard project specifications (BMP 14.5). All areas of organic or mineral soil exposed during construction shall be grass seeded (with native species if possible) and fertilized (BMP 12.17, 14.8).

Noted area of concern: MP 0.00-0.14 contains a 200 ft section of full bench construction.

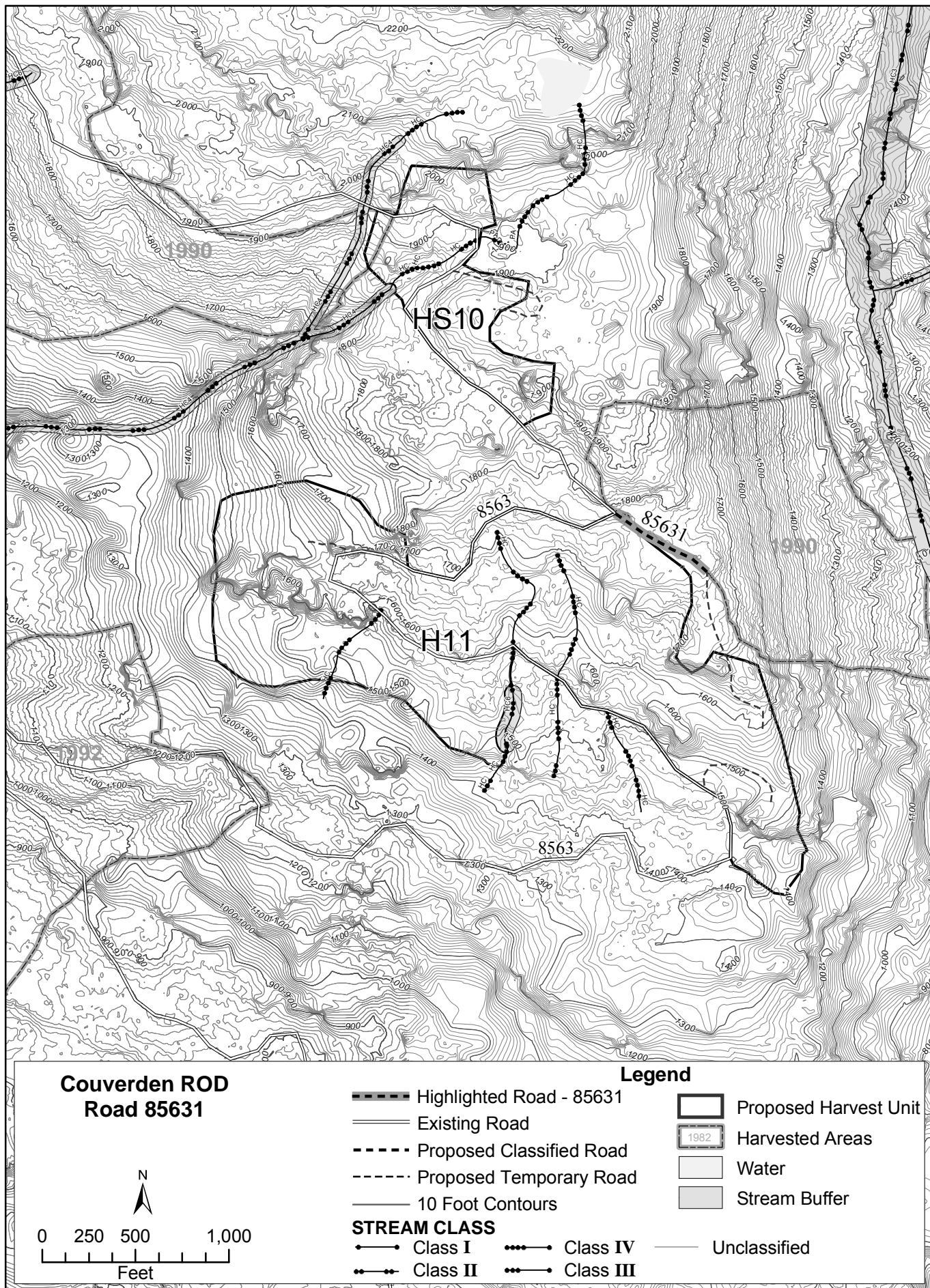
MP 0.14 60' switchback

Rock Pits: During periods of high rainfall (as defined in current regional specifications), blasting operations will be suspended at quarries near potentially unstable sites where ground vibration may induce mass movements (BMP 14.6). Rock pits will require site-specific erosion control plans (BMP 14.18). This road travel through areas of visual concern and therefore attention to visual effects will be necessary when selecting location, size, and layout of a rock pit along this road.

No potential rock pits were noted along this road. Use rock pit near MP 0.965 on Road 8561.

Summary of Mitigation: The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: W9, R1. These measures are described within the applicable resource sections of the EIS.

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ROAD MANAGEMENT OBJECTIVES

Couverden Project- Road 85631

<u>Road Description/Location</u>			
Project/EIS	System	Land Use Designation	
Couverden	Couverden	TM	
Route No.	Route Name	Status	
85631		New Construction	
Begin M.P.	Length(miles)	Begin Terminus	End Terminus
0.00	0.11	MP 3.14 of the 8563 Road	MP 0.11

<u>General Design Criteria and Elements</u>							
Functional Class	Service Life	Traffic Service Level	Surface	Width	Critical Vehicle	Design Vehicle	Design Speed
Local	LI	D	Shot rock	14'	Low boy	Logging truck	10 mph
Intended Purpose/Future Use:							
Access for silvicultural activities. Close road after harvest to minimize wildlife disturbance and reduce maintenance needs. The road will be placed in a storage condition after use. Roads in storage are not considered usable by normal vehicle traffic. (Note: Except for 0.8 mile of the 8550 road, existing roads will remain open and would be available for OHV use.)							

<u>Maintenance Criteria</u>	
Operational Maintenance Level 2 (Planned Initial Condition)	Objective Maintenance Level 1 (Desired Future Condition)
Maintenance Narrative:	
AFR&P Regs. “active” status: Keep culverts, catchbasins, ditches, and road blocks functional. Grade as needed to maintain crown and running surface. Control roadside brush to maintain sight distance (MP 0.00 – 0.11).	
Storage AFR&P Regs “closed” status: Place road in storage, MP 0.00 – 0.11, remove or bypass culverts, add waterbars as needed.	

<u>Operation Criteria</u>	
Highway Safety Act: No	Jurisdiction: National Forest ownership
Travel Management Strategies	
Encourage:	N/A
Accept:	Hikers after timber harvest.
Discourage:	Mountain bikes after timber harvest.
Prohibit:	Public traffic during timber harvest. Motor vehicles after timber harvest.
Eliminate:	N/A

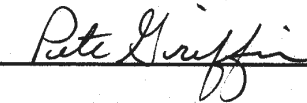
Record of Decision

Travel Management Narrative:

Maintenance Level 1: While the road is at this maintenance level the road will be closed and access for motorized highway vehicles will be blocked by placing a closing device at the beginning of Road 85631. Mountain bike usage on this road will be discouraged by signing.

Maintenance Level 2: While the road is at this maintenance level it is open to high clearance highway vehicles and non-highway vehicles. Public travel on this isolated road system is expected to be very low. Administrative traffic for post-sale silvicultural purpose and road maintenance are expected to generate most of the traffic on the system.

District Ranger Approval (signature)



Date: 6-28-05

Site Specific Design Criteria

Road Segment Description

Milepost (miles)	Grade (%)	Average Side-slopes (%)	Length (feet)	Comments
0.00 to 0.11	5a to 5f	5-20	580	Unclassified road requires brushing, removal of water bars, ditch, add cross drainpipes, grading and additional rock as needed.

*a = adverse; f = favorable

Stream Crossing: None.

Wetlands: None noted.

Erosion Control: An erosion control plan for road construction and maintenance will be developed according to standard project specifications (BMP 14.5). All areas of organic or mineral soil exposed during construction shall be grass seeded (with native species if possible) and fertilized (BMP 12.17, 14.8).

Rock Pits: During periods of high rainfall (as defined in current regional specifications), blasting operations will be suspended at quarries near potentially unstable sites where ground vibration may induce mass movements (BMP 14.6). Rock pits will require site-specific erosion control plans (BMP 14.18). This road travels through areas of visual concern and therefore attention to visual effects will be necessary when selecting location, size, and layout of a rock pit along this road. Sites noted as potential rock pit are listed below:

None noted along this road. Can use rock pit near MP 3.143 on Road 8563.

Summary of Mitigation: The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: W9. These measures are described within the resource sections that apply.

FINAL

ENVIRONMENTAL IMPACT STATEMENT

Couverden Timber Sales

Final Environmental Impact Statement
July 2005

United States Department of Agriculture
Forest Service - Alaska Region

Lead Agency:	USDA Forest Service Tongass National Forest
Responsible Official:	Forrest Cole Forest Supervisor Tongass National Forest
For Information Contact:	Dave Carr Tongass National Forest Juneau Ranger District 8465 Old Dairy Road Juneau, AK 99801-8041

Abstract:

The USDA Forest Service proposes to harvest timber in the Couverden project area, on the Juneau Ranger District, Tongass National Forest. The actions analyzed in the Final Environmental Impact Statement are designed to implement the direction contained in the Tongass Land and Resource Management Plan. This Final EIS describes five action alternatives for harvesting timber and one no action alternative. The action alternatives would harvest from approximately 1 to 5 million board feet to over 27 million board feet of timber. The key issues identified through scoping include: 1) road construction and timber harvest in roadless and unroaded areas; 2) wildlife habitat; 3) timber sale economics; 4) harvest methods; and 5) scenery.

SUMMARY

Summary

Introduction

The Forest Service has prepared this Environmental Impact Statement (EIS) on the potential effects of timber harvest in the Couverden project area (see Figure 1-1) in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. The project area is located on the Chilkat Peninsula and is within the Juneau Ranger District, Tongass National Forest, Alaska. This EIS discloses the direct, indirect, and cumulative environmental effects and any irreversible or irretrievable commitment of resources that would result from the proposed action and alternatives.

Changes Between the Draft EIS and the Final EIS

The Final EIS incorporates several changes to the Draft EIS. Most of these changes were implemented either in response to comments on the Draft EIS by the public, organizations, and agencies, or as a result of an internal review of the Draft EIS. The alternatives considered in the Final EIS are the same as those considered in the Draft EIS.

The changes between the Draft EIS and the Final EIS include:

- ♦ Unit cards in the Draft EIS incorrectly showed the harvest prescription for Unit S39 to be clearcut with reserves under Alternative 3. The correct prescription is selective harvest. Also, the unit, as mapped in the Draft EIS, extended slightly into the inventoried roadless area in Alternative 3. This has been corrected; the unit changed from 24 to 19 acres.
- ♦ Miles of temporary road proposed under Alternative 3 was incorrect in some tables and text in the Draft EIS. The figure listed in Table 3-48 of the Draft EIS was correct.
- ♦ The effects of disturbance associated with helicopter logging have been addressed in the Final EIS; unit cards have been updated to include appropriate mitigation measures.
- ♦ Total harvest volume under Alternative 5 should have read “up to 5 million board feet (mmbf)” instead of 8 mmbf; all associated calculations have been corrected.
- ♦ The U.S. District Court for the District of Wyoming has set aside the Roadless Rule and permanently enjoined its implementation. Also, in May 2005, the Forest Service adopted a new rule. The Final EIS has been updated to reflect these factors.
- ♦ Information on the even-flow, long-term sustained-yield level for the Couverden project area contained in the Timber Resource Report has been included in the Final EIS.
- ♦ Information on past timber harvest in the Couverden project area and the cumulative loss of productive old-growth per VCU has been added.

Summary

- ♦ Additional explanation of the rationale behind the patch size analysis has been added.
- ♦ Additional discussion of the effects of the proposed actions on subsistence resources in the project area has been included.
- ♦ An expanded discussion of the role of matrix lands in the Forest's conservation strategy has been added.
- ♦ Additional information on population and economic trends in rural communities has been included.
- ♦ Miscellaneous errors have been corrected and other edits have been made to improve readability.

Proposed Action

A "proposed action" is defined early in the project-level planning process. This serves as a starting point for the interdisciplinary team (IDT), and gives the public and other agencies specific information on which to focus comments. Using these comments (see discussion of Significant Issues later in this chapter) and information from preliminary analysis, the IDT then develops alternatives to the proposed action. These are discussed in detail in Chapter 2.

The proposed action for the Couverden project area is to plan for sale and harvest of approximately 19.9 million board feet (mmbf) (approximately 39,800 CCF) of timber from approximately 759 acres of National Forest System (NFS) land (Alternative 3). This would require about 3.4 miles of new classified road construction and 3.5 miles of temporary road construction. Logs would be transported to an existing log transfer facility (LTF). Timber from this project would be offered through the Tongass National Forest timber sale program, which is through sales of varying sizes. In addition, the boundaries and/or locations of a small old-growth reserve (OGR) will be evaluated for possible adjustment for wildlife habitat considerations, resulting in a non-significant amendment to the 1997 Tongass Land and Resource Management Plan (Forest Plan).

Decisions to be Made

Based on the environmental analysis in this EIS, the Tongass Forest Supervisor will decide whether and how to make timber available from the Couverden project area in accordance with Forest Plan goals, objectives, and desired conditions. This decision will include the following:

- ♦ The location, design, and scheduling of timber harvest, road construction and reconstruction, LTFs, and silvicultural practices;
- ♦ The estimated timber volume, if any, to make available from the project area at this time;
- ♦ The access management measures (road closures);

- ♦ The mitigation measures and monitoring requirements;
- ♦ A finding whether or not there may be a significant restriction on subsistence uses; and
- ♦ A decision whether or not any changes in small old-growth reserves should be made and approved as a non-significant amendment to the Forest Plan.

Project Area

The Couverden project area is located on the south Chilkat Peninsula along Icy Strait, approximately 30 air miles west of Juneau, 20 air miles southeast of Gustavus, and 13 miles northeast of Hoonah (Figure 1-1). The project area is in the Lynn Canal Biogeographic Province and the Glacier Bay Fjordlands Ecological Section. Excursion Inlet, the closest community to the project area, is approximately 10 miles to the northwest. The project area is within Townships 41 and 42 south, Ranges 61, 62, and 63 west, Copper River Meridian. Portions of the Homeshore, Humpy, and Swanson River drainages are in the project area. Part of inventoried Roadless Area #304, Chilkat-West Lynn Canal, occupies the north and east portion of the project area. The project area includes two small old-growth reserves as designated in the Forest Plan.

The Couverden project area includes approximately 49,500 acres (approximately 44,547 acres NFS land and approximately 4,975 acres of private ownership). The project area includes all of Value Comparison Unit (VCU) 1180 and portions of VCUs 1190, 1200, and 1700 (Figure 1-2). VCUs are comparable to large watersheds and generally follow major watershed divides.

Purpose and Need

Forest Plan Goals and Objectives

The Couverden project area is proposed at this time to respond to goals and objectives of the Forest Plan, and to help move the project area towards desired conditions described in that plan. The Forest Plan includes both forest-wide goals and objectives, and area-specific (Land Use Designation [LUD]) goals, objectives, and desired conditions. Applicable forest-wide goals and objectives (see Forest Plan, pp. 2-3 and 2-4) include the following:

- ♦ Manage the timber resource for production of saw timber and other wood products from suitable timber lands made available for timber harvest on an even-flow, long-term sustained yield basis and in an economically efficient manner.
- ♦ Seek to provide a timber supply sufficient to meet the annual market demand for Tongass National Forest timber, and the market demand for the planning cycle.
- ♦ Provide a diversity of opportunities for resource uses that contribute to the local and regional economies of Southeast Alaska.

Summary

- ♦ Support a wide range of natural-resource employment opportunities within Southeast Alaska's communities.

Goals, objectives, and desired conditions of the land use designations (LUDs) within the project area are described in the following section, "Relationship to the Forest Plan."

Relationship to Forest Plan

Preliminary analysis indicates that as much as 1,717 acres and 50.8 mmbf of timber could be available for harvest from the project area at this time (see also Chapter 2, Alternative Development Process). Appendix A of this document provides information on how this project relates to the overall Tongass Timber Sale program, and why the project is being scheduled at this time.

National forest planning takes place at several levels, including national, regional, forest, and project levels. The Couverden EIS is a project-level analysis. Its scope is confined to addressing the significant issues and possible environmental consequences of the project. It does not attempt to address decisions made at higher levels. It does, however, implement direction provided at those higher levels.

The Forest Plan embodies the provisions of the National Forest Management Act, its implementing regulations, and other guiding documents. The Forest Plan sets forth in detail the direction for managing the land and resources of the Tongass National Forest. The Forest Plan is the result of extensive analysis, which is addressed in the Forest Plan Final EIS (FEIS) and the May 1997 Record of Decision (ROD). Where appropriate, the Couverden EIS tiers to the Forest Plan FEIS, as encouraged by 40 CFR 1502.20.

Forest Plan Land Use Designations

The Forest Plan uses LUDs to guide management of NFS land within the Tongass. Each designation provides for a unique combination of activities, practices, and uses. The Couverden project area includes four LUDs: Timber Production, Scenic Viewshed, Semi-remote Recreation, and Old-growth Habitat. Goals, objectives, and desired conditions of each are included or summarized in Chapter 1, and their locations are shown in Figure 1-2. Chapter 3 of the Forest Plan contains a detailed description of each LUD.

Public Involvement

Scoping

The CEQ defines scoping as "...an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action" (40 CFR 1501.7). Among other things, the scoping process is used to invite public participation, to help identify public issues, and to obtain public comment at various stages of the EIS process. Although scoping began early, it is really an iterative process that continues until a decision is made. In addition to the following specific activities, the Couverden project area has been listed on the Tongass National Forest Schedule of Proposed Actions and was included in the Tongass National Forest 10-year Timber Sale Action Plan for several years. Both are

available on the Internet (<http://www.fs.fed.us/r10/tongass>). To date, the public has been invited to participate in the project in the following ways.

Notice of Intent

A Notice of Intent (NOI) was published in the Federal Register on July 23, 2002, when it was decided that an EIS was to be undertaken for the project.

Public Mailing

In August 2002, a letter providing information and seeking public comment was mailed to over 300 individuals and groups that had previously shown interest in Forest Service projects in Southeast Alaska. This included federal and state agencies, Alaska Native groups, municipal offices, businesses, interest groups, and individuals. A total of 53 responses to this initial mailing were received.

Local News Media

Announcements about the project were printed in the *Juneau Empire*.

Public Meetings

Public meetings were held in Juneau (August 26, 2002), Hoonah (August 27, 2002), and Gustavus (August 28, 2002) to provide project area information, present the proposed action, and discuss local concerns and interests that should be addressed in the Couverden project analysis. Approximately 25 people attended these meetings, and more than 50 commented on the proposed project. While some comments supported the proposed timber sale, most expressed concerns about additional road construction, uneconomic timber harvest, disturbance to scenery and wildlife, and clearcutting as a harvest method.

Meetings with Agencies, Communities, Native Groups, and Others

The Juneau District Ranger and other Forest Service staff discussed the project with representatives of the Hoonah Indian Association on August 27, 2002, and with the Douglas Indian Association on September 12, 2002. Forest Service staff also met with representatives from the Alaska Department of Fish and Game (ADF&G) and the US Fish and Wildlife Service (USFWS) to evaluate the adequacy of the small OGR in the project area. Neither Indian association provided comments. USFWS, Alaska Division of Government Coordination, and ADF&G provided comments. They expressed concerns about effects on fish and wildlife, water quality, and road construction.

Availability of Draft EIS

Draft EIS

Availability of the Draft EIS was announced in the Federal Register and through notices in local papers in December 2003. These notices started a 45-day comment period. EIS documents were also mailed to federal and state agencies, Alaska Native and municipal offices, and anyone else who had requested them. Forest Service staff met with representatives of the Hoonah Indian Association on March 15, 2004. Public meetings were held in Juneau (March 16, 2004), Hoonah (March 17, 2004), and Gustavus (March 18, 2004). Subsistence hearings were held in conjunction with the public meeting in Hoonah and Gustavus to satisfy ANILCA Section 810 requirements. The Forest Service received 71 comment letters on the DEIS in addition to oral testimony at the ANILCA hearings. The comment letters, the Forest Service response, and the ANILCA testimony are included in Appendix E. Forest Service staff again met with members of the Gustavus community to discuss issues related to the project.

Issues

Significant Issues

Significant issues for the Couverden project were identified through public and internal scoping. Similar issues were combined into one statement where appropriate. The following five issues were determined to be significant and within the scope of the project decision. These issues are addressed through the proposed action and alternatives. Additional concerns were considered but determined not to be significant for the project decisions to be made. They are discussed separately below.

Issue 1: Road Construction and Timber Harvest in Roadless and Unroaded Areas

This issue relates to timber harvest and the construction of new roads to facilitate timber harvest in the inventoried roadless area or in smaller unroaded areas (Figure 3-1). Additional roads and harvest could result in reducing the amount of roadless and unroaded area in the project area, which could affect recreation opportunities.

Issue 2: Wildlife Habitat

The issue relates to cumulative effects on wildlife habitat from past, present, and proposed activities. The Forest Plan conservation biology strategy includes a forest-wide network of large, medium, and small OGRs. Timber harvest and road construction could affect corridors connecting old growth habitat. How these reserves are connected by old-growth habitat corridors is an important issue.

The Homeshore drainage includes important brown bear foraging sites. The project area contains medium- and high-volume old growth, which is important to many species, including goshawks, marten, and murrelets. The project area contains a small amount of high-value deer winter range. Harvest and road construction in the Homeshore drainage could adversely

affect bears. Harvest of medium- and high-volume old growth could remove important deer, goshawk, and murrelet habitat.

Issue 3: Timber Sale Economics

This issue relates to the economic viability of proposed timber sale or sales. It also relates to the potential local employment and the revenues generated for communities in the local area. The most economical small-sale opportunities are located along the existing road system. Higher volume sales coupled with road construction may be beyond the means of smaller timber purchasers, as may harvest using helicopter or large cable logging systems.

The current value of hemlock stands in the project area is low. The sale may not be profitable to log.

Issue 4: Harvest Methods

Uneven-age harvest or two-age harvest systems may closely mimic natural disturbance events. Clearcuts may not mimic natural disturbance events in the project area.

Issue 5: Scenery

This issues relates to the effects of the proposed roads and timber harvest on the scenic values of the area, particularly as viewed from Icy Strait. Icy Strait is an important travel way, especially for cruise ships traveling to Glacier Bay National Park. Many people commented that clearcuts detract from the scenic beauty of the area.

Alternative Development Process

The Interdisciplinary Team (IDT) used information from public scoping, including the significant issues identified for the project, in conjunction with the field-verified pool of units and related resource information, to formulate different alternative themes or “frameworks.” Based on these frameworks, the IDT then assigned potential harvest units to each to create the various alternatives. The proposed action and each action alternative presented in this EIS provide a different response to the significant issues. For example, if a project issue concerned the high cost of timber harvest operations, then an alternative minimizing transportation costs by selecting units already accessed by roads might be developed. Each action alternative is also designed to meet the stated purpose and need for the Couverden project, and the project-specific desired conditions.

Each action alternative represents a site-specific proposal developed through intensive interdisciplinary evaluation of timber harvest unit and road design, based on field verification. Unit identification and design also made use of high resolution topographic maps, Light Detection and Ranging (LiDAR) imagery, and aerial photos, and a large quantity of resource data available in geographic information system (GIS) format.

Alternatives Considered in Detail

The proposed action (Alternative 3) and 5 alternatives are considered in detail. Alternative 1 is the no-action alternative, under which the project area would have no timber harvest or road construction at this time, and would remain subject to natural or ongoing changes only. The other action alternatives represent different means of satisfying the purpose and need than does the proposed action by responding with different emphases to the significant issues discussed in Chapter 1 (see Table S-1 for a comparison of the alternatives). Maps of all alternatives considered in detail are provided at the end of Chapter 2. The map for Alternative 1, the no-action alternative, represents the current condition of the project area. Larger-scale maps of the alternatives are contained in the project planning record.

Alternative 1 (No Action)

The emphasis of this alternative is to propose no new timber harvest or road construction in the Couverden project area at this time. It does not preclude timber harvest from other areas at this time, or from the Couverden project area at some time in the future. The Council on Environmental Quality (CEQ) regulations (40 CFR 1502.14d) require that a “no action” alternative be analyzed in every EIS. This alternative represents the existing condition against which the other alternatives are compared. The map for Alternative 1 (Figure 2-1) shows the distribution of vegetation associated with no new timber harvest and the existing OGRs, which would not change under this alternative. Existing roads are currently open to vehicle traffic and they would remain open and would be available for OHV use under this alternative.

Alternative 2

Alternative 2 would implement timber harvest and new road construction according to 1997 Forest Plan Standards and Guidelines to meet resource management objectives (Figure 2-2). Roads built in unroaded areas would be tracked for cumulative effects. The majority of units would have a clearcut with reserves prescription using cable yarding systems. Some units would be helicopter yarded and there would be some single tree selection and group selection in areas designated as partial retention VQO. This alternative would not avoid road building and timber harvest in roadless areas.

Alternative 2 would harvest approximately 27.4 mmbf of timber on approximately 978 acres. Alternative 2 includes 4.3 miles of new classified road construction (1.6 miles of which would be on the roadbeds of unclassified roads) and 3.5 miles of temporary road. All new classified roads would be closed and placed in storage after completion of the timber sale and would not be suitable for normal vehicle traffic; however, some OHV use may occur. All new temporary roads would be closed and obliterated following completion of the timber sale. Existing roads are currently open to vehicle traffic. Except for 0.8 mile of the 8550 road, existing, they would remain open and would be available for OHV use under this alternative. The small OGR in VCU 1180 would be enlarged from 1,469 acres to 2,259 acres.

Alternative 3 Proposed Action

Alternative 3 would avoid road construction and timber harvest in roadless or unroaded areas. In other respects, it would implement timber harvest and new road construction according to 1997 Forest Plan Standards and

Guidelines to meet resource management objectives (Figure 2-3). Approximately 70 percent of the units would have a clearcut with reserves prescription using cable yarding systems; the remainder would have single tree selection and group selection in areas designated as partial retention VQO. No units would be helicopter yarded.

Alternative 3 would harvest approximately 19.9 mmbf of timber on approximately 759 acres. Alternative 3 includes 3.4 miles of new classified road construction (1.6 miles of which would be on the roadbeds of unclassified roads) and 3.5 miles of temporary road. All new classified roads would be closed and placed in storage after completion of the timber sale and would not be suitable for normal vehicle traffic; however, some OHV use may occur. All new temporary roads would be closed and obliterated following completion of the timber sale. Existing roads are currently open to vehicle traffic. Except for 0.8 mile of the 8550 road, existing, they would remain open and would be available for OHV use under this alternative. As in the other action alternatives, the small OGR in VCU 1180 would be enlarged from 1,469 acres to 2,259 acres.

Alternative 4

Alternative 4 would avoid harvest in areas visible from visual priority routes and limit new road construction. All units would have a clearcut with reserves prescription except for one small unit in an area designated as partial retention VQO, which would have a single tree selection and group selection prescription. The majority of units would use cable yarding systems, but some units would be helicopter yarded (Figure 2-4).

Alternative 4 would harvest approximately 14.9 mmbf of timber on approximately 566 acres. Only classified roads that would follow an existing unclassified roadbed and temporary roads would be built. There would be no road construction or timber harvest in roadless or unroaded areas. In other respects, it would implement timber harvest and new road construction according to 1997 Forest Plan Standards and Guidelines to meet resource management objectives. All new classified roads would be closed and placed in storage after completion of the timber sale and would not be suitable for normal vehicle traffic; however, some OHV use may occur. All new temporary roads would be closed and obliterated following completion of the timber sale. Existing roads are currently open to vehicle traffic. Except for 0.8 mile of the 8550 road, existing, they would remain open and would be available for OHV use under this alternative. As in the other action alternatives, the small OGR in VCU 1180 would be enlarged from 1,469 acres to 2,259 acres.

Alternative 5

Alternative 5 would harvest up to 5 mmbf of timber on approximately 367 acres (Figure 2-5). Alternative 5 would only harvest areas within 500 feet of an open road. All harvest would be selective harvest. No new roads would be constructed and no closed roads would be re-opened. This alternative would seek to make 100 mbf to 500 mbf of timber available to local operators each year for 10 years. Existing roads are currently open to vehicle traffic. Except for 0.8 mile of the 8550 road, existing, they would remain open and would be available for OHV use under this alternative. As in the other action alternatives, the small OGR in VCU 1180 would be enlarged from 1,469 acres to 2,259 acres. This alternative is based on recommendations provided by residents of Gustavus.

Summary

Alternative 6

Alternative 6 seeks to provide an economical timber harvest with limited road construction. All units would be harvested using a clearcut with reserves prescription and a cable logging system (Figure 2-6). Alternative 6 would harvest approximately 6.4 mmbf on approximately 172 acres. Only classified roads that would follow an existing unclassified roadbed and temporary roads would be built. All new classified roads would be closed and placed in storage after completion of the timber sale and would not be suitable for normal vehicle traffic; however, some OHV use may occur. All new temporary roads would be closed and obliterated following completion of the timber sale. Existing roads are currently open to vehicle traffic. Except for 0.8 mile of the 8550 road, existing, they would remain open and would be available for OHV use under this alternative. There would be no road construction or timber harvest in roadless or unroaded areas. As in the other action alternatives, the small OGR in VCU 1180 would be enlarged from 1,469 acres to 2,259 acres.

Table S-1
Comparison of Alternatives^{1/}

Effect	Alternative					
	1	2	3	4	5	6
Issue 1: Roadless and Unroaded Areas						
Harvest acres within the IRA #304 (acres) ^{2/}	0	58	0	0	0	0
Miles of new road in the IRA ^{2/}	0	0.6	0	0	0	0
Acres in IRA that would be <600/1200 feet from harvest unit/road	0	312	165	129	0	22
Maximum acres affected in the IRA	0	370	165	129	0	22
Harvest within unroaded areas (acres)	0	63	0	0	0	0
Miles of new road in unroaded areas	0	0.2	0	0	0	0
Issue 2: Wildlife Habitat						
Proposed adjustments to the small OGR (acres)	0	790	790	790	790	790
Acres of productive old-growth forest harvested ^{3/}						
High	0	519	345	228	92	95
Medium	0	331	298	181	136	67
Low	0	98	91	136	113	9
Deer per square mile after harvest	21.5	21.2	21.3	21.4	21.4	21.4
Deer per square mile after 25 years	21.5	21.2	21.3	21.4	21.4	21.4
High-value marten habitat harvested (acres)	0	430	312	218	59	94
Road density (miles/square mile) ^{4/}						
VCU 1170	0	0	0	0	0	0
VCU 1180	0.29	0.29	0.29	0.48	0.29	0.29
VCU 1190	0.61	0.83	0.80	0.70	0.61	0.64
VCU 1200	1.01	1.17	1.15	1.06	1.01	1.01
Total project area	0.46	0.56	0.55	0.55	0.46	0.55
Issue 3: Timber Sale Economics						
Total harvest volume (mmbf)	0	27.4	19.9	14.9	up to 5.0	6.4
Total harvest volume (thousand CCF) ^{5/}	0	54.3	39.8	29.6	up to 9.2	10.0
Average harvest cost (\$/mbf)	-	248.56	248.66	337.14	269.44	206.10
Net stumpage value (\$/mbf)	-	-61.72	-67.42	-166.96	-118.36	-16.50
Employment (job-years)	0	143	105	78	24	26
Road costs (includes reconstruction)		1,016,000	865,000	486,500	85,000	105,000
Issue 4: Harvest Methods^{6/}						
Acres clearcut (with reserves)	0	801	537	554	0	172
Acres single tree selection and group selection	0	177	222	12	367	0
Percent single tree selection and group selection	-	18	29	2	100	0
Issue 5: Scenery						
Harvest areas visible from KVAs (acres) ^{7/}	0	446	313	84	77	34

1/ Refer to Chapter 3 for details and explanations. Watersheds and streams are displayed in Figure 3-21.

2/ IRA – Inventoried Roadless Area as used in the 2003 SEIS to the Forest Plan.

3/ Units also include small areas of non-productive forest and non-forest.

4/ Includes open and closed roads and temporary roads.

5/ Based on NEAT model outputs; these numbers differ slightly from volume in mbf.

6/ Includes productive old-growth forest and small inclusions of other types.

7/ KVA – key viewing area.

Summary

Table S-1 (Continued)
Comparison of Alternatives

Effect	Alternative					
	1	2	3	4	5	6
Other Environmental Considerations						
Soils						
Harvest-related soil disturbance (acres)	0	54	42	32	21	10
Miles of new classified road	0	4.3	3.4	1.4	0	0.4
Miles of temporary road	0	3.5	3.5	2.6	0	0.5
Miles of closed road reconstructed	0	0	0	2.9	0	0
Road/landing-related disturbance (acres)	0	61	51	32	9	6
Watershed and Fisheries						
Percent cumulative harvest disturbance						
Homeshore watershed	8.5	9.7	9.6	8.5	8.9	8.5
North Group drainage area	6.9	12.1	8.7	7.5	8.2	7.1
Humpy watershed	7.9	15.8	13.9	11.9	9.9	10.3
South Group drainage area	4.7	7.6	8.0	6.9	6.4	5.0
Swanson watershed	3.5	3.5	3.5	4.5	3.8	3.5
Cumulative road/stream crossings						
Class I ^{8/}	7	7	7	10	7	7
Class II	9	9	9	9	9	9
Class III	37	43	42	46	37	38
Class IV	32	40	36	39	32	33
Wetlands						
Wetlands acres clearcut with reserves	0	66	66	75	0	13
Wetland acres with single tree selection and group selection	0	5	11	6	44	0
Classified roads in wetlands (acres)	0	<0.25	<0.25	0	0	0
Temporary roads in wetlands (acres)	0	2.7	3.1	3.5	0	0.3
Cumulative harvest in wetlands (acres)	335 ^{9/}	406	412	416	416	347
Recreation						
Net change in ROS settings (acres) ^{10/}						
Primitive (P)	0	0	0	0	0	0
Semi-primitive Non-motorized (SPNM)	0	-1,220	-755	-368	0	-171
Semi-primitive Motorized (SPM)	0	-116	-298	-618	0	0
Road Natural (RN)	0	0	0	0	0	0
Roaded Modified (RM)	0	1,336	1,053	987	0	171

8/ Alternative 4 includes 3 reopened crossings on Road 8555, which would only be reconstructed under Alternative 4.

9/ Includes past temporary and classified roads and harvest on wetlands.

10/ ROS – Recreation Opportunity Spectrum

Note: Numbers are not exact due to rounding.

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Acronyms and Abbreviations

ACRONYMS AND ABBREVIATIONS

ACMP	Alaska Coastal Management Program
ADF&G	Alaska Department of Fish and Game
Advisory Council	President's Advisory Council on Historical Preservation
AHRS	Alaska Heritage Resource Survey
ALIS	Alaska Land Information System
ANCSA	Alaska Native Claims Settlement Act
ANILCA	Alaska National Interest Lands Conservation Act
ASQ	allowable sale quantity
BMP	Best Management Practice
CA	census area
CCF	hundred cubic feet
CEQ	Council on Environmental Quality
CIP	Capital Improvement Projects
CZMA	Coastal Zone Management Act
dbh	diameter at breast height
DCED	Alaska Department of Community and Economic Development
DEIS	Draft Environmental Impact Statement
DOL	Department of Labor
DZ	distance zone
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act
EVC	Existing Visual Condition
Forest Plan	1997 Tongass Land and Resource Management Plan
FY	Fiscal Year
GIS	geographic information system
HIA	Hoonah Indian Association
HSI	habitat suitability index
IDT	interdisciplinary team
IRA	Inventoried Roadless Area
KVA	Key Viewing Area
LTF	log transfer facility
LUD	Land Use Designation
LWD	large woody debris
mbf	thousand board feet
MIS	management indicator species
ML	Maintenance Level
mmbf	million board feet

Acronyms and Abbreviations

MMI	Mass Movement Index
National Register	National Registry of Historic Places
NEAT	NEPA Economic Analysis Tool
NEPA	National Environmental Policy Act
NFMA	National Forest Management Act
NFS	National Forest System
NIC	non-interchangeable components
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NWI	National Wetlands Inventory
OGR	Old-growth Reserve
OHV	Off-highway vehicle
P	Primitive
PL	Public Law
PNW	Pacific Northwest
POG	productive old-growth
RARE	Forest Service Roadless Area Review and Evaluation
RM	Roaded Modified
RMA	Riparian Management Area
RN	Roaded Non-modified
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
RPA	Forest and Rangeland Renewable Resources Planning Act
SEIS	Supplemental Environmental Impact Statement
SHPO	State Historic Preservation Office
SOC	species of concern
SOI	species of interest
SPM	Semi-primitive Motorized
SPNM	Semi-primitive Non-motorized
TEA	Transactional Evidence Appraisal
TES	threatened, endangered, and sensitive
TTRA	Tongass Timber Reform Act
U.S.C.	United States Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VAC	Visual Absorbtion Capacity
VCU	Value Comparison Unit
VPR	Visual Priority Travel Routes
VQO	Visual Quality Objective
WAA	Wildlife Analysis Area
WARS	Wilderness Attribute Rating System

Acronyms and Abbreviations

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CHAPTER 1

PURPOSE AND NEED

Chapter 1

Purpose and Need

Introduction

The Forest Service has prepared this Environmental Impact Statement (EIS) on the potential effects of timber harvest in the Couverden project area (see Figure 1-1) in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. The project area is located on the Chilkat Peninsula and is within the Juneau Ranger District, Tongass National Forest, Alaska. This EIS discloses the direct, indirect, and cumulative environmental impacts and any irreversible or irretrievable commitment of resources that would result from the proposed action and alternatives.

This EIS was prepared according to the format established by Council on Environmental Quality (CEQ) regulations implementing NEPA (40 CFR 1500-1508). Chapter 1, in addition to explaining the purpose and need for the proposed action, discusses how the Couverden project relates to the Revised 1997 Tongass Land and Resource Management Plan (Forest Plan), and identifies the significant issues driving the EIS analysis. Chapter 2 describes and compares the proposed action, alternatives to the proposed action, and a no-action alternative, and summarizes the significant environmental consequences by issue. Chapter 3 describes the natural and human environments potentially affected by the proposed action and alternatives, and discloses what potential effects are anticipated. Chapter 4 contains the list of preparers, the EIS distribution list, literature cited, a glossary, and an index. Appendices provide additional information on specific aspects of the proposed project. This EIS incorporates documented analyses by summarization and reference, where appropriate.

The interdisciplinary team (IDT) used a systematic approach for analyzing the proposed project and alternatives to it, estimating the environmental effects, and preparing this EIS. The planning process complies with NEPA and the CEQ regulations. Planning was coordinated with the appropriate federal, state, and local agencies, and local federally recognized tribes.

Copies of this Final EIS (FEIS) may be obtained from the Juneau Ranger District. Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record, which is also located at the Juneau Ranger District Office in Juneau, Alaska. Other reference documents such as the Tongass Forest Plan and the Tongass Timber Reform Act are available from public libraries in Southeast Alaska, as well as at the Forest Supervisor's Office in Sitka, Alaska. The Forest Plan is also available on the internet and CD-ROM.

1 Purpose and Need

Changes Between the Draft EIS and the Final EIS

The Final EIS incorporates several changes to the Draft EIS. Most of these changes were implemented either in response to comments on the Draft EIS by the public, organizations, and agencies, or as a result of an internal review of the Draft EIS. The alternatives considered in the Final EIS are the same as those considered in the Draft EIS.

The changes between the Draft EIS and the Final EIS include:

- ♦ Unit cards in the Draft EIS incorrectly showed the harvest prescription for Unit S39 to be clearcut with reserves under Alternative 3. The correct prescription is selective harvest. Also, the unit, as mapped in the Draft EIS, extended slightly into the inventoried roadless area in Alternative 3. This has been corrected; the unit changed from 24 to 19 acres.
- ♦ Miles of temporary road proposed under Alternative 3 was incorrect in some tables and text in the Draft EIS. The figure listed in Table 3-48 of the Draft EIS was correct.
- ♦ The effects of disturbance associated with helicopter logging have been addressed in the Final EIS; unit cards have been updated to include appropriate mitigation measures.
- ♦ Total harvest volume under Alternative 5 should have read “up to 5 million board feet (mmbf)” instead of 8 mmbf; all associated calculations have been corrected.
- ♦ The U.S. District Court for the District of Wyoming has set aside the Roadless Rule and permanently enjoined its implementation. Also, in May 2005, the Forest Service adopted a new rule. The Final EIS has been updated to reflect these factors.
- ♦ Information on the even-flow, long-term sustained-yield level for the Couverden project area contained in the Timber Resource Report has been included in the Final EIS.
- ♦ Information on past timber harvest in the Couverden project area and the cumulative loss of productive old-growth per VCU has been added.
- ♦ Additional explanation of the rationale behind the patch size analysis has been added.
- ♦ Additional discussion of the effects of the proposed actions on subsistence resources in the project area has been included.
- ♦ An expanded discussion of the role of matrix lands in the Forest’s conservation strategy has been added.
- ♦ Additional information on population and economic trends in rural communities has been included.
- ♦ Miscellaneous errors have been corrected and other edits have been made to improve readability.

Proposed Action

A “proposed action” is defined early in the project-level planning process. This serves as a starting point for the IDT, and gives the public and other agencies specific information on which to focus comments. Using these comments (see discussion of Significant Issues later in this chapter) and information from preliminary analysis, the interdisciplinary team then develops alternatives to the proposed action. These are discussed in detail in Chapter 2.

The proposed action for the Couverden project area is to plan for sale and harvest of approximately 19.9 million board feet (mmbf) (approximately 39,800 ccf) of timber from approximately 759 acres of National Forest System land (Alternative 3). This would require about 3.4 miles of new classified road construction and 3.5 miles of temporary road construction. Logs would be transported to an existing log transfer facility (LTF). Timber from this project would be offered through the Tongass National Forest timber sale program, which is through sales of varying sizes. In addition, the boundaries and/or locations of a small old-growth reserve (OGR) will be evaluated for possible adjustment for wildlife habitat considerations, resulting in a non-significant amendment to the Tongass Forest Plan.

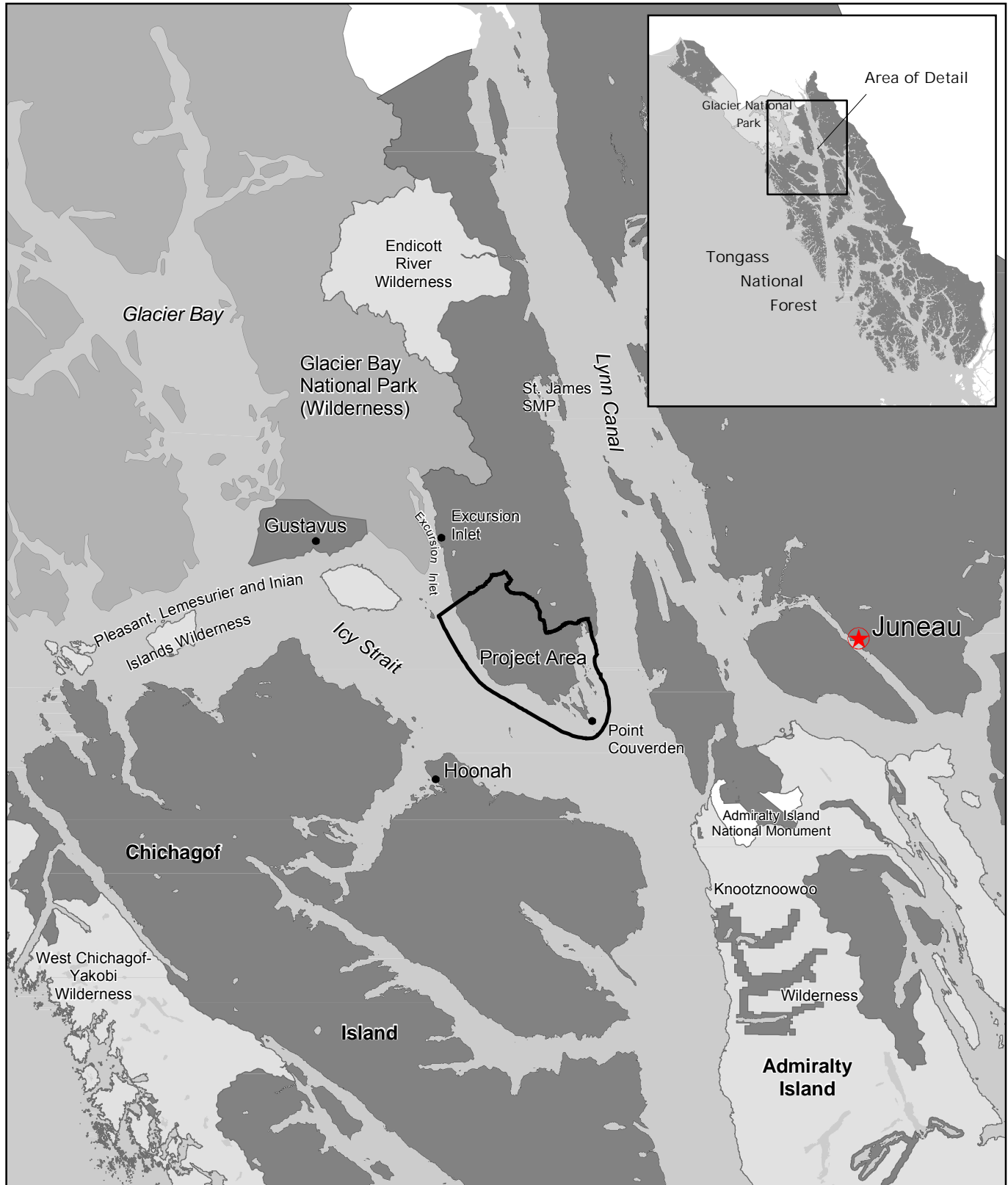
Decisions to be Made

Based on the environmental analysis in this EIS, the Tongass Forest Supervisor will decide whether and how to make timber available from the Couverden project area in accordance with Forest Plan goals, objectives, and desired conditions. This decision will include the following:

- ♦ The location, design, and scheduling of timber harvest, road construction and reconstruction, LTFs, and silvicultural practices.
- ♦ The estimated timber volume, if any, to make available from the project area at this time.
- ♦ The access management measures (road closures).
- ♦ The mitigation measures and monitoring requirements.
- ♦ A determination whether or not there may be a significant restriction on subsistence uses.
- ♦ A decision whether or not any changes in small old-growth reserves should be made and approved as a non-significant amendment to the Forest Plan.

Project Area

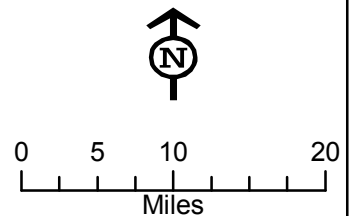
The Couverden project area is located on the south Chilkat Peninsula along Icy Strait, approximately 30 air miles west of Juneau, 20 air miles southeast of Gustavus, and 13 miles northeast of Hoonah (Figure 1-1). The project area is in the Lynn Canal Biogeographic Province and the Glacier Bay Fjordlands Ecological Section. Excursion Inlet, the closest community to the project area, is approximately 10 miles to the northwest. The project area is



Legend

- Towns
- ★ State Capital
- ▭ Project Boundary
- National Forest System Land
- Glacier Bay National Park
- Open Water
- Wilderness/Wilderness National Monument
- Non-Wilderness National Monument

Figure 1-1
Vicinity Map



within Townships 41 and 42 south, Ranges 61, 62, and 63 west, Copper River Meridian.

Portions of the Homeshore, Humpy, and Swanson River drainages are in the project area. Part of Inventoried Roadless Area #304, Chilkat-West Lynn Canal, occupies the north and east portion of the project area. The project area includes two small old-growth LUDs as designated in the Forest Plan.

The Couverden project area includes approximately 49,500 acres (approximately 44,547 acres NFS land and approximately 4,975 acres of state and private land). The project area includes all of Value Comparison Unit (VCU) 1180 and portions of VCUs 1190, 1200, and 1170 (Figure 1-2). VCUs are comparable to large watersheds and generally follow major watershed divides.

Purpose and Need

Forest Plan Goals and Objectives

The Couverden project area is proposed at this time to respond to goals and objectives of the Forest Plan, and to help move the project area towards desired conditions described in that plan. The Forest Plan includes both forest-wide goals and objectives, and area-specific (Land Use Designation [LUD]) goals, objectives, and desired conditions. Applicable forest-wide goals and objectives (see Forest Plan, pp. 2-3 and 2-4) include the following:

1. Manage the timber resource for production of saw timber and other wood products from suitable timber lands made available for timber harvest on an even-flow, long-term sustained yield basis and in an economically efficient manner.
2. Seek to provide a timber supply sufficient to meet the annual market demand for Tongass National Forest timber, and the market demand for the planning cycle.
3. Provide a diversity of opportunities for resource uses that contribute to the local and regional economies of Southeast Alaska.
4. Support a wide range of natural-resource employment opportunities within Southeast Alaska's communities.

Goals, objectives, and desired conditions of the LUDs within the project area are described in the next section, "Relationship to the Forest Plan."

Relationship to Forest Plan

Preliminary analysis indicated that as much as 1,717 acres and 50.8 million board feet (mmbf) of timber could be available for harvest from the project area at this time (see also Chapter 2, "Alternative Development Process"). Appendix A of this document provides information on how this project relates to the overall Tongass Timber Sale program, and why the project is being scheduled at this time.

1 Purpose and Need

Forest Plan Land Use Designations

National forest planning takes place at several levels, including national, regional, forest, and project levels. The Couverden EIS is a project-level analysis. Its scope is confined to addressing the significant issues and possible environmental consequences of the project. It does not attempt to address decisions made at higher levels. It does, however, implement direction provided at those higher levels.

The Forest Plan embodies the provisions of the National Forest Management Act (NFMA), its implementing regulations, and other guiding documents. The Forest Plan sets forth in detail the direction for managing the land and resources of the Tongass National Forest. The Forest Plan is the result of extensive analysis, which is addressed in the Forest Plan Final EIS (FEIS) and the May 1997 Record of Decision (ROD). Where appropriate, the Couverden EIS tiers to the Forest Plan FEIS, as encouraged by 40 CFR 1502.20.

The Forest Plan uses LUDs to guide management of NFS land within the Tongass. Each designation provides for a unique combination of activities, practices, and uses. The Couverden project area includes four LUDs. Goals, objectives, and desired conditions of each are included or summarized below, and their locations are shown in Figure 1-2. Chapter 3 of the Forest Plan contains a detailed description of each LUD.

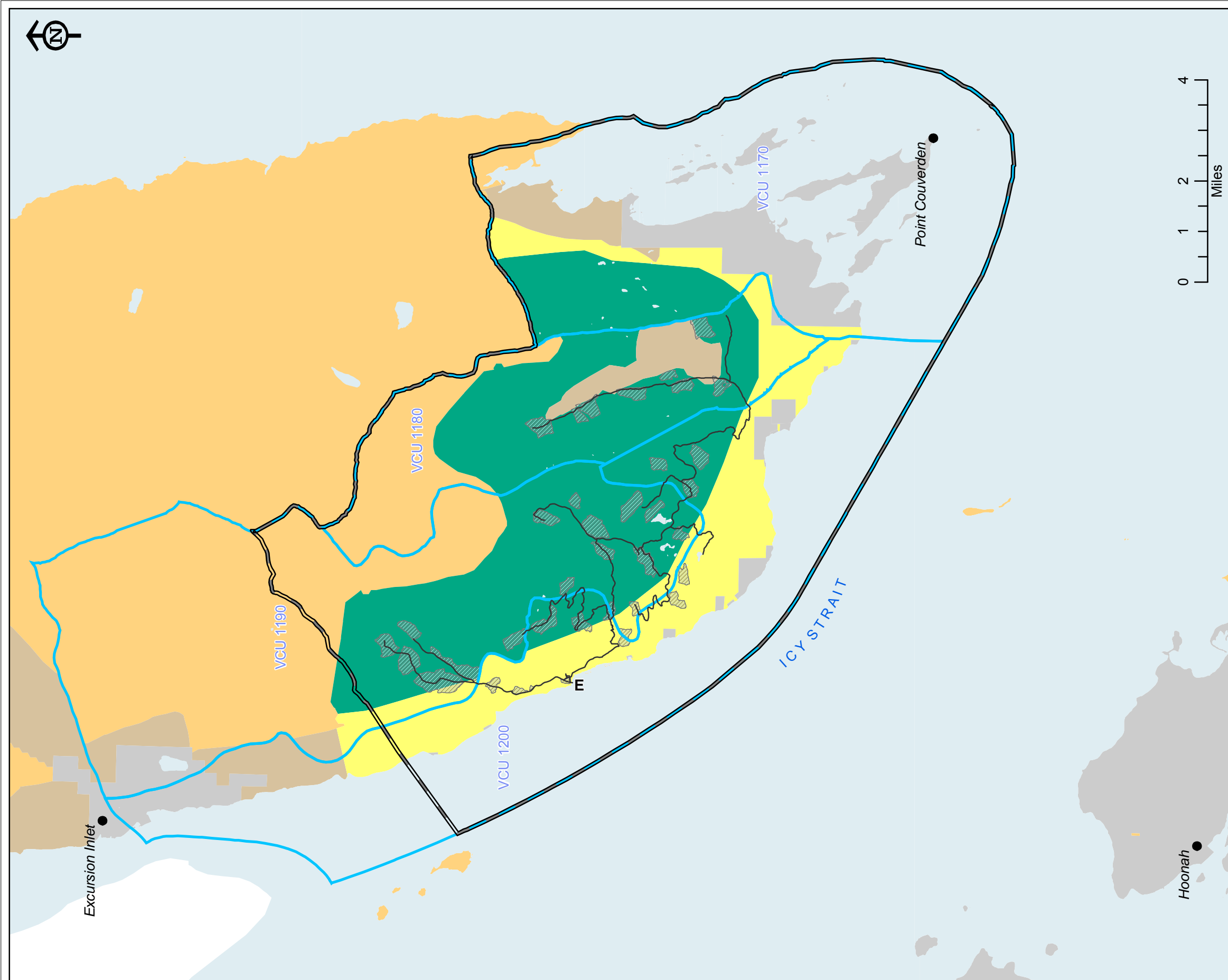
Timber Production

The goals of this designation are as follows:

- ♦ Maintain and promote industrial wood production from suitable timber lands and, thus, provide a continuous supply of wood to meet society's needs.
- ♦ Manage these lands for sustained long-term timber yields.
- ♦ Seek to provide a supply of timber from the Tongass National Forest, which meets the annual and planning-cycle market demand, consistent with the standards and guidelines of this land use designation.

Timber management objectives of this LUD include the following:

- ♦ Seek to reduce clearcutting when other methods will meet land management objectives.
- ♦ Improve timber growth and productivity on commercial forest lands.
- ♦ Plan, inventory, prepare, offer, sell, and administer timber sales and permits to ensure the orderly development of timber production.



Legend

	Land Use Designation
	Old Growth
	Semi-Remote Recreation
	Scenic Viewshed
	Timber Production
	Non-NFS Land

	LTF - Log Transfer Facility
	Existing Classified Road
	Project Boundary
	VCU Boundary
	Previous Harvest
	Water Body

Figure 1-2
Project Area

The desired condition for the Timber Production LUD includes a sustained yield of timber, healthy tree stands in a balanced mix of age classes from young stands to trees of harvestable age, and a road system providing access for timber management, as well as recreation, hunting and fishing, and other public uses. Recreation opportunities associated with roaded settings are available. Wildlife habitats are predominantly in the early and middle successional stages.

Scenic Viewshed

The goals of this designation repeat the third goal under Timber Production, and include two others:

- ♦ Provide a sustained yield of timber and a mix of resource activities while minimizing the visibility of developments as seen from visual priority travel routes and use areas.
- ♦ Recognize the scenic values of suitable timber lands viewed from selected popular roads, trails, marine travel routes, recreation sites, bays, and anchorages, and modify timber harvest practices accordingly.

Timber management objectives of the Scenic Viewshed LUD are the same as those included for Timber Production. The scenery objective is to apply the Retention Visual Quality Objective (VQO) in the foreground distance zone and Partial Retention in the remaining zones, as seen from visual priority travel routes and use areas.

The desired condition for the Scenic Viewshed LUD emphasizes a natural-appearing landscape as viewed by users of visual priority travel routes and use areas. Recreation and tourism opportunities in a range of settings are available. A variety of successional stages providing wildlife habitat occur, although late successional stages predominate.

Semi-Remote Recreation

The goals of this designation are as follows:

- ♦ Provide predominately natural or natural-appearing settings for semi-primitive types of recreation and tourism and for occasional enclaves of concentrated recreation and tourism facilities.
- ♦ Provide opportunities for a moderate degree of independence, closeness to nature, and self-reliance in environments requiring challenging motorized or non-motorized forms of transportation.

Objectives of this LUD include managing for recreation and tourism use and activities that are consistent with Semi-primitive Recreation. Traditional use of boats is allowed. The scenery objective is to apply the Partial Retention VQO to any developments. Timber management is not an objective.

The desired future condition for the Semi-remote Recreation LUD emphasizes an unmodified natural environment where ecological processes and natural conditions are only minimally affected by past or current human

1 Purpose and Need

use or activities. Users have the opportunity to experience a moderate degree of independence, closeness to nature, solitude, and remoteness.

Old-growth Habitat

The goals of this designation are as follows:

- ♦ Maintain areas of old-growth forests and their associated natural ecological processes to provide habitat for old-growth associated resources.
- ♦ Manage early seral conifer stands to achieve old-growth forest characteristic structure and composition based upon site capability.

Applicable objectives of Old-growth Habitat include the following:

- ♦ Provide old-growth forest habitats, in combination with other land use designations, to maintain viable populations of fish and wildlife species that may be closely associated with old-growth forests.
- ♦ Contribute to the habitat capability of fish and wildlife resources to support sustainable human subsistence and recreational uses.
- ♦ Maintain components of flora and fauna biodiversity and ecological desired condition for the Old-growth Habitat LUD, which emphasizes all forested areas attaining old-growth forest characteristics and provides a diversity of old-growth habitat types, associated species, and ecological processes.

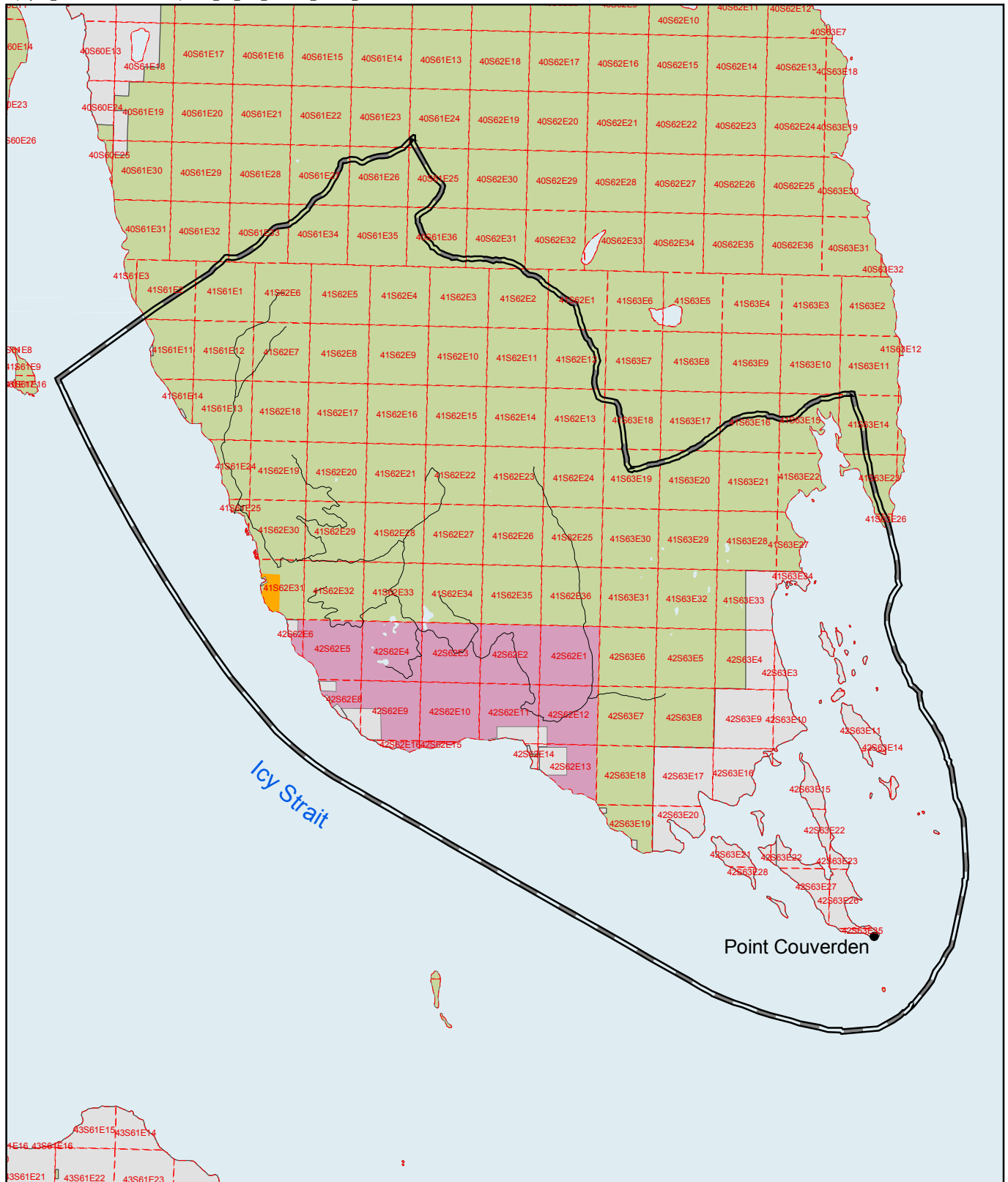
Table 1-1 gives the acreage within the project area of each LUD, and of lands in state or private ownership. In addition to the acres shown in Table 1-1, NFS land in Sections 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, and 16, Township 42 South, Range 62 East have been selected by the Huna Totem Corporation (Figure 1-3). The Huna Totem Corporation has over selected lands and may not choose to receive all or part of the lands in the project area. There is also a Native allotment application for a coastal portion of Section 31, Township 41 South, Range 62 East (Figure 1-3). The application has not yet been adjudicated. Figure 1-2 displays the location of the land allocations and VCUs within the project area.

Table 1-1
Project Area Land Use Designations and non-National Forest System Acreages^{1/}

Timber Production	Scenic Viewshed	Semi-remote Recreation	Old-growth Habitat	Other Ownership^{2/}	Total Acres
23,448	9,831	8,470	2,798	4,975	49,522

1/ Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

2/ Approximately 4,192 acres are state park lands and 783 acres are small, privately owned parcels.



Legend

- Towns
- Existing Classified Road
- Project Boundary
- Section Boundary
- Huna Totum Corporation Over-selection
- Native Allotment Application
- National Forest Service Land
- Non-NFS Land

Figure 1-3
Over-selected Land



0 0.5 1 2
Miles

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Forest Plan Standards and Guidelines

The following Forest Plan Standards and Guidelines delineate spatial areas not available for programmed timber harvest within LUDs that are otherwise available. Each applies to a specific habitat or ecological component. These areas are included within the (Scenic Viewshed, Modified Landscape, and Timber Production) designations described above. Many other Forest Plan Standards and Guidelines apply, and many of these are summarized in Chapter 2. Detailed information about these and other standards and guidelines is included in Chapter 4 of the Forest Plan.

Beach and Estuary Fringe

The beach and estuary fringe is an area of approximately 1,000 feet inland from mean high tide around all marine coastline. Programmed timber harvest is not allowed, and roads are located outside the fringe when possible.

Karst and Caves

Potential karst areas on the eastern edge of the Couverden project area have been identified, and these are categorized as medium and high vulnerability. High vulnerability areas are not suitable for programmed timber harvest. No harvest or road building activities are planned in these areas.

Riparian

Riparian Management Areas (RMAs) are areas of special concern to fish, other aquatic resources, and wildlife. These areas are delineated according to the process group direction in the riparian Forest-wide Standards and Guidelines (USDA Forest Service 1997a). Timber harvest is not scheduled in RMAs, although trees may be cut for road construction or cable corridors.

Project Area Desired Condition

The desired conditions described for the Forest Plan LUDs, in conjunction with the other Forest Plan direction outlined above, provide the parameters for identifying and defining project-specific desired conditions. The following desired conditions will help guide management of the project consistent with the Forest Plan, the significant issues (described below), and the ecological conditions of the project area.

Timber harvest is proposed in the LUDs, Timber Production, and Scenic Viewshed. Areas managed under the Timber Production LUD have an extensive road network to provide access for timber management activities, recreation, hunting and fishing, and other public and administrative uses. Some roads may be closed to address resource concerns. Management activities generally dominate most seen areas. Tree stands are healthy and include a balanced mix of age classes, from young stands to trees of

harvestable age, often in 40- to 100-acre stands. Recreation opportunities associated with roaded settings from Semi-primitive to Roaded Modified are available. A variety of wildlife habitats, predominantly in the early and middle successional stages, are present.

Areas managed under the Scenic Viewshed LUD provide forest visitors, recreationists, and others using identified travel routes a natural-appearing landscape. Management activities in the foreground are not evident to the casual observer and activities in the middleground and background are subordinate to the characteristic landscape. Within visible areas, timber harvest units are typically small and affect only a small percentage of the seen area. Roads and other facilities are either not visible or are subordinate to the landscape. A variety of successional stages provide wildlife habitat, although late successional stages predominate.

Public Involvement

Scoping

The CEQ defines scoping as "...an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action" (40 CFR 1501.7). Among other things, the scoping process is used to invite public participation, to help identify public issues, and to obtain public comment at various stages of the EIS process. Although scoping began early, it is really an iterative process that continues until a decision is made. In addition to the following specific activities, the Couverden project has been listed on the Tongass National Forest Schedule of Proposed Actions and included in the Tongass National Forest 10-year Timber Sale Action Plan for several years. Both are available on the Internet (<http://www.fs.fed/r10/tongass>). To date, the public has been invited to participate in the project in the following ways.

Notice of Intent

A Notice of Intent (NOI) was published in the Federal Register on July 23, 2002, when it was decided that an EIS was to be undertaken for the project.

Public Mailing

In August 2002, a letter providing information and seeking public comment was mailed to over 300 individuals and groups that had previously shown interest in Forest Service projects in Southeast Alaska. This included federal and state agencies, Alaska Native groups, municipal offices, businesses, interest groups, and individuals. A total of 53 responses to this initial mailing were received.

Local News Media

Announcements about the project were printed in the *Juneau Empire*.

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Public Meetings

Public meetings were held in Juneau (August 26, 2002), Hoonah (August 27, 2002), and Gustavus (August 28, 2002) to provide project area information, present the proposed action, and discuss local concerns and interests that should be addressed in the Couverden project analysis. Approximately 25 people attended these meetings, and more than 50 commented on the proposed project. While some comments supported the proposed timber sale, most expressed concerns about additional road construction, uneconomic timber harvest, disturbance to scenery and wildlife, and clearcutting as a harvest method.

Meetings with Agencies, Communities, Native Groups, and Others

The Juneau District Ranger and other Forest Service staff discussed the project with representatives of the Hoonah Indian Association on August 27, 2002, and with the Douglas Indian Association on September 12, 2002. Forest Service staff also met with representatives from the Alaska Department of Fish and Game (ADF&G) and the US Fish and Wildlife Service (USFWS) to evaluate the adequacy of the small old-growth reserve in the project area. Neither Indian association provided comments. USFWS, Alaska Division of Government Coordination, and ADF&G provided comments. They expressed concerns about effects on fish and wildlife, water quality, and road construction.

Availability of Draft EIS

Draft EIS

Availability of the Draft EIS was announced in the Federal Register and through notices in local papers in December 2003. These notices started a 45-day comment period. EIS documents were also mailed to federal and state agencies, Alaska Native and municipal offices, and anyone else who had requested them. Forest Service staff met with representatives of the Hoonah Indian Association on March 15, 2004. Public meetings were held in Juneau (March 16, 2004), Hoonah (March 17, 2004), and Gustavus (March 18, 2004). Subsistence hearings were held in conjunction with the public meeting in Hoonah and Gustavus to satisfy ANILCA Section 810 requirements. The Forest Service received 71 comment letters on the DEIS in addition to oral testimony at the ANILCA hearings. The comment letters, the Forest Service response, and the ANILCA testimony are included in Appendix E. Forest Service staff again met with members of the Gustavus community to discuss issues related to the project.

Issues

Significant Issues

Significant issues for the Couverden project area were identified through public and internal scoping. Similar issues were combined into one statement where appropriate. The following five issues were determined to be significant and within the scope of the project decision. These issues are addressed through the proposed action and alternatives. Additional

concerns were considered but determined not to be significant for the project decisions to be made. They are discussed separately below.

Issue 1: Road Construction and Timber Harvest in Roadless and Unroaded Areas

This issue relates to timber harvest and the construction of new roads to facilitate timber harvest in the inventoried roadless area or in smaller unroaded areas (Figure 3-1). Additional roads and harvest could result in reducing the amount of roadless and unroaded area in the project area, which could affect recreation opportunities.

Issue 2: Wildlife Habitat

The issue relates to cumulative effects on wildlife habitat from past, present, and proposed activities. The Forest Plan conservation biology strategy includes a forest-wide network of large, medium, and small OGRs. Timber harvest and road construction could affect corridors connecting old growth habitat. How these reserves are connected by old-growth habitat corridors is an important issue.

The Homeshore drainage includes important brown bear foraging sites. The project area contains medium- and high-volume old growth, which is important to many species, including goshawks, marten, and murrelets. The project area contains a small amount of high-value deer winter range. Harvest and road construction in the Homeshore drainage could adversely affect bears. Harvest of medium- and high-volume old growth could remove important deer, goshawk, and murrelet habitat.

Issue 3: Timber Sale Economics

This issue relates to the economic viability of proposed timber sale or sales. It also relates to the potential local employment and the revenues generated for communities in the local area. The most economical small-sale opportunities are located along the existing road system. Higher volume sales coupled with road construction may be beyond the means of smaller timber purchasers, as may harvest using helicopter or large cable logging systems.

The current value of hemlock stands in the project area is low. The sale may not be profitable to log.

Issue 4: Harvest Methods

Uneven-age harvest or two-age harvest systems may closely mimic natural disturbance events. Clearcuts may not mimic natural disturbance events in the project area.

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Issue 5: Scenery

This issue relates to the effects of the proposed roads and timber harvest on the scenic values of the area, particularly as viewed from Icy Strait. Icy Strait is an important travel way, especially for cruise ships traveling to Glacier Bay National Park. Many people commented that clearcuts detract from the scenic beauty of the area.

Other Issues and Concerns

The following public concerns were considered but were determined not to be significant issues. Some are already addressed through other processes or in the Forest Plan (see “Items Common to All Alternatives” in Chapter 2), or their resolution is beyond the scope of this project. As needed, the following resource effects related to these concerns are discussed in Chapter 3:

- ♦ Water Quality
- ♦ Fishery Resources
- ♦ Vegetation
- ♦ Threatened, Endangered, and Sensitive Listed Species
- ♦ Subsistence
- ♦ Recreation
- ♦ Heritage

Federal and State Permits, Licenses, and Certifications

To proceed with timber harvest as addressed in this EIS, various permits must be obtained from federal and state agencies. The following permits will be obtained.

U.S. Army Corps of Engineers

Approval of discharge of dredged or fill material into waters of the United States (Section 404 of the Clean Water Act of 1977, as amended).

Approval of construction of structures or work in navigable waters of the United States (Section 10 of the Rivers and Harbors Act of 1899).

U.S. Environmental Protection Agency

Storm water discharge permit.

National Pollutant Discharge Elimination System review (Section 402 of the Clean Water Act).

State of Alaska, Department of Natural Resources

Authorization for occupancy and use of tidelands and submerged lands.

State of Alaska, Department of Environmental Conservation

Certification of compliance with Alaska Water Quality Standards (Section 401 Certification).

Solid Waste Disposal Permit (Section 402 of the Clean Water Act).

U.S. Coast Guard

Coast Guard Bridge Permit (in accordance with the General Bridge Act of 1946) required for all structures constructed across navigable waters (within the tidal influence zone) of the United States.

Applicable Laws and Executive Orders

Shown below is a partial list of federal laws and executive orders pertaining to project-specific planning and environmental analysis on federal lands.

While most pertain to all federal lands, some of the laws are specific to Alaska. Disclosures and findings required by the following laws and orders are contained in Chapter 3 of this EIS:

Organic Administration Act of 1897

Migratory Bird Treaty Act of 1918

Rivers and Harbors Act of 1938

Multiple-Use Sustained-Yield Act of 1960

National Historic Preservation Act of 1966 (as amended)

Wild and Scenic Rivers Act of 1968, amended 1986

National Environmental Policy Act (NEPA) of 1969 (as amended)

Clean Air Act of 1970 (as amended)

Coastal Zone Management Act (CZMA) of 1972 (as amended)

Alaska Native Claims Settlement Act (ANCSA) of 1971

Marine Mammal Protection Act of 1972

Endangered Species Act (ESA) of 1973 (as amended)

Forest and Rangeland Renewable Resources Planning Act (RPA) of 1974 (as amended)

National Forest Management Act (NFMA) of 1976 (as amended)

Clean Water Act of 1977 (as amended)

American Indian Religious Freedom Act of 1978

Alaska National Interest Lands Conservation Act (ANILCA) of 1980

Archeological Resource Protection Act of 1980

Cave Resource Protection Act of 1988

Tongass Timber Reform Act (TTRA) of 1990

Magnuson-Stevens Fishery Conservation and Management Act of 1996

Executive Order 11593 (cultural resources)

Executive Order 11988 (floodplains)

Executive Order 11990 (wetlands)

Executive Order 12898 (environmental justice)

Executive Order 12962 (aquatic systems and recreational fisheries)

Executive Order 13186 (migratory bird protection)

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CHAPTER 2

ALTERNATIVES

Chapter 2

Alternatives

Introduction

This chapter describes and compares the alternatives considered by the Forest Service for the Couverden project area. It includes a discussion of how alternatives were developed; an overview of mitigation measures, monitoring, and other features common to all alternatives; a description and map of each alternative considered in detail; and a comparison of these alternatives focusing on the significant issues. Alternative 3 is identified as the preferred alternative. Chapter 2 is intended to present the alternatives in comparative form, sharply defining the issues and providing a clear basis for choice among options by the decision maker and the public (40 CFR 1502.14).

Some of the information used to compare alternatives at the end of Chapter 2 is summarized from Chapter 3, "Affected Environment and Environmental Consequences." Chapter 3 contains the detailed scientific basis for establishing baselines and measuring the potential environmental consequences of each of the alternatives. For a full understanding of the effects of the alternatives, readers will need to consult Chapter 3.

Alternative Development Process

Feasibility Analysis

The Couverden project area includes approximately 49,500 acres. In order to synthesize the various resource conditions, objectives, and opportunities, an interdisciplinary team (IDT) conducted a feasibility analysis of the entire planning area. The analysis identified logical "treatment" areas (silvicultural treatment accomplished through timber harvesting), and ranked these for consideration for timber harvest and environmental analysis. The Couverden project area was selected for timber harvest consideration because of the relatively large number of suitable timber acres currently available for management. The current and desired conditions of the landscape and applicable goals and objectives of the 1997 Tongass Land and Resource Management Plan (Forest Plan) (see Purpose and Need in Chapter 1) were factors in this selection. Preliminary project-level desired conditions were developed at that time. The Couverden position statement was completed in 2001. It documents the landscape analysis process and is part of the Couverden project planning record.

The unit pool for the Couverden project area was initially based on all the commercial forest lands classified as suitable under the Forest Plan. A pool of potential units was then selected that reflects how much timber the Couverden project area could potentially provide at this time given the parameters of the Forest Plan. This preliminary harvest unit pool included 2,096 acres in 49 potential units. Additional early analysis of this unit pool

2 Alternatives

led to deferring or dropping several potential harvest units from further consideration at this time. When analyzed in more detail, some of these units were determined not to be harvestable without violating Forest Plan Standards and Guidelines, and some would require modifications to meet standards and guidelines that would make them uneconomical to harvest.

Proposed Action

Based on short- and long-term landscape or resource objectives (see Chapter 1), the IDT assigned preliminary timber harvest prescriptions for each potential harvest unit. This unit pool and the roads needed to access the units were then evaluated in the field. This pool of units was also used for public scoping for the project, and was identified at that time as the “proposed action.” The proposed action for this EIS, as described in Chapter 1 and considered in detail as Alternative 3, has changed slightly from the one described during scoping as a result of field analysis. For example, four proposed units in the Homeshore watershed were dropped from consideration at this time because they are used by bears to reach critical brown bear foraging habitat in and along Homeshore Creek. Harvest in these units would be delayed until forest in adjacent areas (harvested in the early 1980s) has matured to the point that it can provide alternate travel corridors for the bears.

Potential harvest units were validated, modified, dropped, and/or deferred based on findings of field investigations. Modifications were made as needed to meet Forest Plan Standards and Guidelines. For instance, if a previously unknown stream was discovered (i.e., was not visible on aerial photos), the Riparian Forest-wide Standards and Guidelines would be applied. Some units were adjusted to have more logical boundaries or to facilitate logging systems, and some expanded to prevent isolating timber stands from future harvest. This effort led to the current unit pool, 1,267 acres and 38 units, from which the proposed action and all action alternatives were developed. Site-specific descriptions and resource considerations for each potential harvest unit (called unit cards) are included as Appendix B of this EIS. Proposed access roads are described in Appendix C (road cards).

Development of Alternatives

The IDT used information from public scoping, including the significant issues identified for the project (see Chapter 1), in conjunction with the field-verified pool of units and related resource information, to formulate different alternative themes or “frameworks.” Based on these frameworks, the IDT then assigned potential harvest units to each to create the various alternatives. The proposed action and each action alternative presented in this EIS provide a different response to the significant issues. For example, if a project issue concerned the high cost of timber harvest operations, then an alternative minimizing transportation costs by selecting units already accessed by roads might be developed. Each action alternative is also designed to meet the stated purpose and need for the Couverden project, and the project-specific desired conditions.

Each action alternative represents a site-specific proposal developed through intensive interdisciplinary evaluation of timber harvest unit and road design based on field verification. Unit identification and design also made use of high resolution topographic maps, light distance and ranging (LiDAR)

imagery, and aerial photos, and a large quantity of resource data available in geographic information system (GIS) format. All acres and miles used in this document are estimates based on GIS mapping. Differences in the various data layers in GIS may result in slightly different acreages for various resource components.

Items Common to All Alternatives

All alternatives including the proposed action are consistent with the Forest Plan. All applicable forest-wide and Land Use Designation (LUD) Standards and Guidelines have been incorporated. The Forest Service uses many mitigation and preventive measures in the planning and implementation of land management activities. The application of these measures begins during the planning and design phases of a project. Additional direction comes from the applicable Forest Service manuals and handbooks.

The following items are listed to highlight some of the key direction from the Tongass Forest Plan (primarily from Chapter 4, “Forest-wide Standards and Guidelines”). See also the next section, Project-specific Mitigation, and the unit cards and road cards in Appendices B and C.

Biodiversity and Old Growth

Each alternative complies with the Forest Plan conservation biology strategy designed to ensure well-distributed viable populations of wildlife.

The small Old-growth Reserves (OGRs) (Old-growth Habitat LUD) mapped in the Forest Plan FEIS have been evaluated for size, spacing, and habitat composition. An interagency review by biologists from the USDA Forest Service, Alaska Department of Fish and Game (ADF&G), and United States Fish and Wildlife Service (USFWS) determined that the mapped small OGR in Value Comparison Unit (VCU) 1180 did not meet the requirements for size and it did not optimize deer winter habitat. The review team recommended that the boundary be adjusted. The additional forested acreage would include high and very high Volstrata stands that provide high-value deer, marten, marbled murrelet, and goshawk habitat.

The modified OGR would be approximately 2,259 acres compared to 1,469 acres identified in the Forest Plan. All action alternatives include a non-significant Forest Plan Amendment that would adopt this recommendation.

Fish and Marine Habitats

Forest Plan Standards and Guidelines for riparian areas are applied to all fish streams within the project area, and to non-fish-bearing Class III streams.

Road cards (Appendix C) show which streams are likely to need special attention during implementation, such as applying timing restrictions for in-stream activities or using larger-than-normal culverts or bridges.

Karst Resources

The existing log transfer facility (LTF) would be used for this project. Logs would be loaded directly onto barges. Some reconstruction would be needed, but the “footprint” of the LTF would not change.

All activities have been designed to avoid karst areas.

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Heritage Resources	<p>Areas considered as having a high probability of containing heritage resources (cultural sites) have been intensively surveyed by cultural resource specialists. All identified cultural sites have been avoided. The Forest Service recommends a finding of “No Historic Properties Affected.” The State Historic Preservation Officer concurred with this recommendation on May 20, 2003.</p>
Scenery	<p>Areas within the viewshed of a priority travel route or use area as identified in the Forest Plan, if retained in the timber-suitable land base, have been allocated to the Scenic Viewshed LUD in the Forest Plan. Units within these areas have been designed to meet the Visual Quality Objectives (VQOs) of the applicable designation.</p>
Soils, Water Quality, and Wetlands	<p>Potential harvest units with slopes greater than 72 percent have received an on-site analysis of slope and Class IV channel stability and an assessment of potential downstream effects. No harvest would occur on slopes greater than 72 percent.</p> <p>Road locations avoid slopes greater than 67 percent, unstable areas, and slide-prone areas.</p> <p>All roads have been located and will be designed to avoid or minimize effects on wetlands.</p> <p>All new roads would be closed following completion of the project. All excess material removed during road construction or road closing would be stored in a stable, upland location approved for this use. Roads would be closed at the first practical point, either by tank trap at the beginning of the road, at the first stream crossing, or by official road closure order.</p>
Subsistence	<p>All alternatives have been evaluated in compliance with Alaska National Interest Lands Conservation Act (ANILCA), Title VIII, Section 810.</p>
Threatened, Endangered, and Sensitive Listed Species	<p>Biological assessments have been completed, and concurrences will be obtained from the responsible federal agency for any threatened or endangered species potentially inhabiting the project area. Standards and guidelines have been applied as needed to ensure that any listed species or its habitat will not be adversely affected.</p> <p>Biological evaluations for all sensitive listed species potentially inhabiting the project area have been completed. The Forest Plan contains standards and guidelines for each designated sensitive species, and these are incorporated into the project as applicable.</p>
Timber Harvesting	<p>Alternatives to traditional clearcutting are prescribed for all units under Alternative 5, six units each under Alternatives 2 and 3, and one unit under Alternative 4. These prescriptions rely on diameter limit designations to accomplish both group and single tree selection harvest.</p> <p>Risks from windthrow have been evaluated, and means to minimize windthrow are incorporated into all harvest unit prescriptions.</p>

Project-specific Mitigation

The analysis documented in this EIS discloses the possible adverse effects that may occur from implementing the actions proposed under each alternative. Measures have been formulated to mitigate or reduce these effects. These measures were guided by the direction from the Tongass Forest Plan previously described (in this chapter and in Chapter 1).

IDT specialists use on-the-ground inventories, computer (GIS) data, and aerial photographs to prepare unit cards for each harvest unit in the unit pool for the project. Cards are also prepared for each segment of road. Resource specialists include their concerns on the cards and then describe how the concerns can be mitigated (if not completely avoided) in the design of each unit and road segment. These cards may be found in Appendices B and C.

Applicable Forest Plan Standards and Guidelines, the Best Management Practices (BMPs) used to meet the requirements of the Clean Water Act, and project-specific mitigation measures are identified on the harvest unit and road cards. Appendix D includes a complete list of the project-specific measures and a table linking each measure to the applicable harvest units.

Monitoring

Monitoring activities can be divided into Forest Plan monitoring and project-specific monitoring. The National Forest Management Act (NFMA) requires that National Forests monitor and evaluate their forest plans (36 CFR 219.11). Chapter 6 of the Forest Plan includes the monitoring and evaluation activities to be conducted as part of Forest Plan implementation. There are three categories of Forest Plan monitoring, including:

Implementation monitoring. Used to determine if the goals, objectives, standards and guidelines, and practices of the Forest Plan are implemented in accordance with the Forest Plan.

Effectiveness monitoring. Used to determine if the Forest Plan standards and guidelines, and practices, as designed and implemented are effective in accomplishing the desired result.

Validation monitoring. Used to determine whether the data, assumptions, and estimated effects used in developing the Forest Plan are correct.

Effectiveness and validation monitoring are not typically done as part of project implementation. Implementation monitoring and any additional project-specific monitoring are, however, important aspects of the project.

Routine Implementation Monitoring

Routine implementation monitoring assesses whether the project was implemented as designed and whether or not it complies with the Forest Plan. Planning for routine implementation monitoring began with the preliminary design of harvest units and roads (see previous discussion of mitigation). The unit and road cards (Appendices B and C), and unit silvicultural prescriptions, will be the basis for determining whether

2 Alternatives

recommendations were implemented for various aspects of the Couverden project.

Routine implementation monitoring is part of the administration of a timber sale contract. The sale administrators and road inspectors ensure that the prescriptions contained on the unit and road cards, and the unit silvicultural prescriptions, are incorporated into contract documents. They then monitor performance relative to contract requirements. Input by resource staff specialists, such as fisheries biologists, soil scientists, hydrologists, and engineers, is regularly requested during this implementation monitoring process. These specialists provide technical advice when questions arise during project implementation.

Tongass National Forest staff annually conduct a review of BMP implementation and effectiveness. The results of this and other monitoring are summarized in a Tongass National Forest Annual Monitoring and Evaluation Report. This report provides information about how well the management direction of the Forest is being carried out, and measures the accomplishment of anticipated outputs, activities, and effects.

Alternatives Considered but Eliminated from Detailed Study

Other alternatives were considered during the planning process, but have not been included in the EIS for detailed study. These are described briefly below, along with the reasons for not considering them further.

An alternative that only included helicopter yarding was considered but eliminated because of the high cost, and because other alternatives were considered with little or no new road construction using less expensive yarding methods.

The proposed action originally considered several additional units. Four proposed units in the Homeshore watershed were dropped from consideration because they are used by bears to reach critical brown bear foraging habitat in and along Homeshore Creek. Harvest in these units will be delayed until forest in adjacent areas has matured to the point that it can provide alternate travel corridors for the bears. Several units were also determined to be either uneconomical to harvest at this time or are not suitable for timber management.

Alternatives Considered in Detail

The proposed action (Alternative 3) and 5 alternatives are considered in detail. Alternative 1 is the no-action alternative, under which the project area would have no timber harvest or road construction at this time, and would remain subject to natural or ongoing changes only. The other action alternatives represent different means of satisfying the purpose and need than does the proposed action by responding with different emphases to the significant issues discussed in Chapter 1. Maps of all alternatives considered in detail are provided at the end of Chapter 2. The map for Alternative 1, the no-action alternative, represents the current condition of

the project area. Larger-scale maps of the alternatives are contained in the project planning record.

Alternative 1 (No Action)

The emphasis of this alternative is to propose no new timber harvest or road construction in the Couverden project area at this time. It does not preclude timber harvest from other areas at this time, or from the Couverden project area at some time in the future. The Council on Environmental Quality (CEQ) regulations (40 CFR 1502.14d) require that a “no action” alternative be analyzed in every EIS. This alternative represents the existing condition against which the other alternatives are compared. The map for Alternative 1 (Figure 2-1) shows the distribution of vegetation associated with no new timber harvest and the existing OGRs, which would not change under this alternative. Existing roads are currently open to vehicle traffic and they would remain open and would be available for OHV use under this alternative.

Alternative 2

Alternative 2 would implement timber harvest and new road construction according to 1997 Forest Plan Standards and Guidelines to meet resource management objectives (Table 2-1 and Figure 2-2). Roads built in roadless and unroaded areas would be tracked for cumulative effects. The majority of units would have a clearcut with reserves prescription using cable yarding systems. Some units would be helicopter yarded and there would be some single tree selection and group selection in areas designated as Partial Retention VQO. This alternative would not avoid road building and timber harvest in roadless areas.

The timber proposed for sale in Alternative 2 would provide opportunities for timber harvesting by local operators. It would also help move the project area towards the desired condition of the Forest Plan by converting old-

Table 2-1
Alternative 2—Harvest Objectives and Practices

Category	Unit or Measure	Amount
Harvest Method		
Clearcut with reserves	acres ^{5/}	801
Selection harvest	acres	177
Harvest Volume ^{1/}	mmbf ^{2/}	27.4
Harvest System ^{1/}		
Cable/Shovel	mmbf	23.4
Helicopter	mmbf	4.0
Roads		
New construction	miles	4.3
Temporary construction	miles	3.5
Reconstruction	miles	0
Economics		
Average harvest cost	\$/mbf ^{3/}	248.56
Net stumpage value ^{4/}	\$/mbf	-61.72
Employment	jobs/year	143

1/ excluding incidental right-of-way volume

2/ mmbf = million board feet

3/ mbf = thousand board feet

4/ at current market prices

5/ Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

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growth stands to young growth. Alternative 2 could be offered as one or more sales. Alternative 2 includes 4.3 miles of new classified road construction (1.6 miles of which would be on the roadbeds of unclassified roads) and 3.5 miles of temporary road. All new classified roads would be closed and placed in storage after completion of the timber sale and would not be suitable for normal vehicle traffic; however, some OHV use may occur. All new temporary roads would be closed and obliterated following completion of the timber sale. Existing roads are currently open to vehicle traffic. Except for 0.8 mile of the 8550 road, existing, they would remain open and would be available for OHV use under this alternative.

Alternative 3 Proposed Action

Alternative 3 would avoid road construction and timber harvest in roadless or unroaded areas. In other respects, it would implement timber harvest and new road construction according to 1997 Forest Plan Standards and Guidelines to meet resource management objectives (Table 2-2 and Figure 2-3). The majority of units would have a clearcut with reserves prescription using cable yarding systems, but there would be some single tree selection and group selection in areas designated as Partial Retention VQO. No units would be helicopter yarded.

The timber proposed for sale in Alternative 3 would provide opportunities for timber harvesting by local operators. It would also help move the project area towards the desired condition of the Forest Plan by converting old-growth stands to young growth. Alternative 3 could be offered as one large sale and/or as a combination of smaller sales. Alternative 3 includes 3.4 miles of new classified road construction (1.6 miles of which would be on the roadbeds of unclassified roads) and 3.5 miles of temporary road. All new classified roads would be closed and placed in storage after completion of the

Table 2-2
Alternative 3—Harvest Objectives and Practices

Category	Unit or Measure	Amount
Harvest Method		
Clearcut with reserves	acres ^{5/}	537
Selection harvest	acres	222
Harvest Volume ^{1/}	mmbf ^{2/}	19.9
Harvest System ^{1/}		
Cable/ Shovel	mmbf	19.9
Helicopter	mmbf	0
Roads		
New construction	Miles	3.4
Temporary construction	Miles	3.5
Reconstruction	Miles	0
Economics		
Average harvest cost	\$/mbf ^{3/}	248.66
Net stumpage value ^{4/}	\$/mbf	-67.42
Employment	jobs/year	105

1/ excluding incidental right-of-way volume

2/ mmbf = million board feet

3/ mbf = thousand board feet

4/ at current market prices

5/ Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

Table 2-3

Alternative 4—Harvest Objectives and Practices

Category	Unit or Measure	Amount
Harvest Method		
Clearcut with reserves	acres ^{5/}	554
Selection harvest	acres	12
Harvest Volume ^{1/}	mmbf ^{2/}	14.9
Harvest System ^{1/}		
Cable/ Shovel	mmbf	14.6
Helicopter	mmbf	0.3
Roads		
New construction	miles	1.4
Temporary construction	miles	2.6
Reconstruction	miles	2.9
Economics		
Average harvest cost	\$/mbf ^{3/}	337.14
Net stumpage value ^{4/}	\$/mbf	-166.96
Employment	jobs/year	78

1/ excluding incidental right-of-way volume

2/ mmbf = million board feet

3/ mbf = thousand board feet

4/ at current market prices

5/ Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

timber sale and would not be suitable for normal vehicle traffic; however, some OHV use may occur. All new temporary roads would be closed and obliterated following completion of the timber sale. Existing roads are currently open to vehicle traffic. Except for 0.8 mile of the 8550 road, existing, they would remain open and would be available for OHV use under this alternative.

Alternative 4

Alternative 4 would avoid harvest in areas visible from visual priority routes and limit new road construction. All units would be have a clearcut with reserves prescription except for one small unit in an area designated as Partial Retention VQO, which would have a single tree selection and group selection prescription. The majority of units would use cable yarding systems, but some units would be helicopter yarded. Only classified roads that would follow an existing unclassified roadbed and temporary roads would be built. There would be no road construction or timber harvest in roadless or unroaded areas. In other respects, it would implement timber harvest and new road construction according to 1997 Forest Plan Standards and Guidelines to meet resource management objectives (Table 2-3 and Figure 2-4).

The timber proposed for sale in Alternative 4 would provide opportunities for timber harvesting by local operators. It would also help move the project area towards the desired condition of the Forest Plan by converting old-growth stands to young growth. Alternative 4 could be offered as one or more sales. All new classified roads would be closed and placed in storage after completion of the timber sale and would not be suitable for normal vehicle traffic; however, some OHV use may occur. All new temporary roads would be closed and obliterated following completion of the timber sale. Existing roads are currently open to vehicle traffic. Except for 0.8 mile

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of the 8550 road, existing, they would remain open and would be available for OHV use under this alternative.

Alternative 5

Alternative 5 would only harvest areas within 500 feet of an open road (Table 2-4 and Figure 2-5). All harvest would be selective harvest, removing approximately half the volume. No new roads would be constructed and no closed roads would be re-opened. This alternative would seek to make 100 thousand board feet (mbf) to 500 mbf of timber available to local operators each year for 10 years. This alternative is based on recommendations provided by residents of Gustavus. Existing roads are currently open to vehicle traffic. Except for 0.8 mile of the 8550 road, existing, they would remain open and would be available for OHV use under this alternative.

Table 2-4
Alternative 5—Harvest Objectives and Practices

Category	Unit or Measure	Amount
Harvest Method		
Clearcut with reserves	acres ^{5/}	0
Selection harvest	acres	367
Harvest Volume ^{1/}	mmbf ^{2/}	up to 5.0
Harvest System ^{1/}		
Cable/ Shovel	mmbf	up to 5.0
Helicopter	mmbf	0
Roads		
New construction	miles	0
Temporary construction	miles	0
Reconstruction	miles	0
Economics		
Average harvest cost	\$/mbf ^{3/}	269.44
Net stumpage value ^{4/}	\$/mbf	-118.36
Employment	jobs/year	24

1/ excluding incidental right-of-way volume

2/ mmbf = million board feet

3/ mbf = thousand board feet

4/ at current market prices

5/ Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

Alternative 6

Alternative 6 seeks to provide an economical timber harvest with limited road construction (Table 2-5 and Figure 2-6). All units would be harvested using a clearcut with reserves prescription and a cable logging system. Only classified roads that would follow an existing unclassified roadbed and temporary roads would be built. There would be no road construction or timber harvest in roadless or unroaded areas.

The timber proposed for sale in Alternative 6 would provide opportunities for timber harvesting by local operators. It would also help move the project area towards the desired condition of the Forest Plan by converting old-growth stands to young growth. Alternative 6 could be offered as one or more sales. All new roads would be closed to motorized vehicles (except OHVs) after completion of harvest activities. All new classified roads would be closed and placed in storage after completion of the timber sale and would not be suitable for normal vehicle traffic; however, some OHV use may occur.

Table 2-5
Alternative 6—Harvest Objectives and Practices

Category	Unit or Measure	Amount
Harvest Method		
Clearcut with reserves	acres ^{5/}	172
Selection harvest	acres	0
Harvest Volume ^{1/}	mmbf ^{2/}	6.4
Harvest System ^{1/}		
Cable/ Shovel	mmbf	6.4
Helicopter	mmbf	0
Roads		
New construction	miles	0.4
Temporary construction	miles	0.5
Reconstruction	miles	0
Economics		
Average harvest cost	\$/mbf ^{3/}	206.10
Net stumpage value ^{4/}	\$/mbf	-16.5
Employment	jobs/year	26

1/ excluding incidental right-of-way volume

2/ mmbf = million board feet

3/ mbf = thousand board feet

4/ at current market prices

5/ Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

All new temporary roads would be closed and obliterated following completion of the timber sale. Existing roads are currently open to vehicle traffic. Except for 0.8 mile of the 8550 road, existing, they would remain open and would be available for OHV use under this alternative.

Comparison of Alternatives

This section compares outputs, objectives, and effects of the alternatives in terms of the significant issues for the Couverden project. The discussions of effects are summarized from Chapter 3, which should be consulted for a full understanding of these and other environmental consequences. Table 2-6, which follows the discussion of key issues, provides an overview comparison of information from the alternative descriptions and Chapter 3 relevant to the issues and other environmental considerations.

Issue 1: Road Construction and Timber Harvest in Roadless and Unroaded Areas

Alternative 2 is the only alternative that proposes to harvest or build roads within the Chilkat-West Lynn Canal Roadless Area. Approximately 58 acres (6 percent) of the 978 acres proposed for harvest under Alternative 2 are in the inventoried roadless area as defined in the Supplemental EIS (SEIS) to the Forest Plan. Nineteen acres are in the Inventoried Roadless Area as mapped for the Roadless Rule; however, the Roadless Rule is no longer in effect. Additionally, 0.6 mile of classified road are proposed to be built in the roadless area, along its edge. Alternative 2 would also result in the most acreage (312 acres) that would be less than 600 feet from the edge of a timber harvest unit or 1,200 feet from a road (refer to the discussion under Issue 1 in Chapter 3). Therefore, if the roadless area is redrawn at a future roadless inventory using the 600- and 1,200-foot distances, it would be 370 acres smaller.

2 Alternatives

Alternatives 3, 4, and 6 would have similar effects on the Chilkat-West Lynn Canal Roadless Area; no harvest or road construction is proposed in the roadless area. In all three alternatives, there would be acres in the roadless area that would no longer be 600 feet from a timber harvest or 1,200 feet from a road because of harvest or road building near the edge of the roadless area. Approximately 165 acres would be affected under Alternative 3, approximately 129 acres under Alternative 4, and approximately 22 acres under Alternative 6. That accounts for less than 0.1 percent of the inventoried roadless area in all three alternatives. Alternatives 1 and 5 would have no effect on the roadless area.

Eight uninventoried roadless areas (referred to as unroaded areas) are within the project area, totaling approximately 2,989 acres. Alternative 2 proposes harvest in 63 of these unroaded acres. This would involve construction of 0.2 mile of classified road and less than 0.1 mile of temporary roads within the unroaded areas. None of the other alternatives harvest timber or construct roads in these unroaded areas.

The primary effect on the roadless area would be that of creating visual disturbance in the viewshed for areas close to the proposed harvest units (refer to Issue 5). The area has existing clearcuts that are in various stages of regrowth, and the proposed actions would add additional visual disturbance. This could reduce the pleasure of people recreating in the roadless area.

Issue 2: Wildlife Habitat

All action alternatives would expand the small OGR in VCU 1180, adding 790 acres to the reserve. The OGR would not be adjusted under Alternative 1.

Alternative 2 would harvest the most productive old-growth forest (948 acres), followed by Alternatives 3 (734 acres), 4 (545 acres), 5 (341 acres), and 6 (171 acres). Alternative 2 would also harvest the most high-volume old-growth forest (519 acres), followed by Alternatives 3 (345 acres), 4 (228 acres), 6 (95 acres), and 5 (92 acres). Alternative 1 would not include any harvest.

There would be little change in the number of deer that the project area could support under the various alternatives. The deer model projects that the project areas could support 21.5 deer per square mile under Alternative 1, 21.2 under Alternative 2, 21.3 under Alternative 3, and 21.4 under Alternatives 4, 5, and 6.

Road density would remain about the same under all alternatives after the project is completed, less than 0.5 mile per square mile under Alternatives 1, 3, 4, 5, and 6, and 0.6 mile per square mile under Alternative 2 (including closed roads).

None of the proposed action alternatives would significantly change the estimated number of deer per square mile. Based on harvest statistics, very few deer are taken from the project area (see the Subsistence Resource Report). Most documented deer harvest comes from VCU 1200, which incorporates much of the beach fringe and is more easily accessible to hunters. Nearly all of the 1,000-foot beach fringe is productive old-growth

forest, and provides important deer winter habitat and connectivity to adjacent areas. Most of the beach fringe is either National Forest System land or state park land.

Issue 3: Timber Sale Economics

Alternative 2 would harvest the most timber, approximately 27.4 mmbf. This alternative would require road building and timber harvest in roadless areas. All other alternatives would avoid building roads in roadless areas as identified by the Roadless Rule and Forest Plan SEIS inventories. Of these alternatives, Alternative 3 would have the highest harvest volume, approximately 19.9 mmbf. Alternative 4 would harvest approximately 14.9 mmbf, Alternative 5 would harvest up to 5.0 mmbf, and Alternative 6 would harvest approximately 6.4 mmbf. Alternative 1 would not harvest any timber and would not meet the purpose and need at this time.

Viewed from the standpoint of providing the most cost-efficient harvest, an aspect of the purpose and need for the project, Alternative 6 would be best. It has a projected net stumpage value of -\$16.50 per mbf under current market conditions; however, it would not provide as many jobs as the other action alternatives. Alternative 2 has a projected net stumpage value of -\$61.72 per mbf, followed by Alternatives 3 (-\$67.42 per mbf), 5 (-\$118.36 per mbf), and 4 (-\$166.96 per mbf).

None of the proposed alternatives would be economically viable under current market conditions when appraised to a 6-inch top. Timber would not be sold unless timber values increased. Alternative 6 is positive when appraised to a 10-inch top. Appraising timber to a 10-inch top diameter under high market conditions may result in other alternatives becoming economically viable.

Issue 4: Harvest Methods

Alternative 5 would only utilize selective harvest methods (diameter cut and group selection). Approximately 29 percent of the acres harvested under Alternative 3 would be selectively harvested and 18 percent under Alternative 2. Alternative 4 would only utilize selective harvest methods on 1 unit, approximately 2 percent of the total acres, and Alternative 6 would not employ selective harvest methods.

Alternative 5 would best respond to the issue by only using uneven age and two-age harvest methods that may more closely mimic natural disturbance events. Alternative 4 responds least to the issue, resulting in the most acres clearcut with reserves. Alternative 6 would only implement clearcut with reserves, but it would harvest fewer acres than the other alternatives.

Issue 5: Scenery

All alternatives would meet Forest Plan Standards and Guidelines for visual resource management. Various techniques would be implemented, such as selective harvest, including diameter limits and patch cutting, concentrating residual trees in seen areas, and altering unit boundaries. Among the action alternatives, Alternative 6 would harvest the fewest acres in areas visible from key viewing areas (34 acres). Residual trees would be left in visible areas to limit adverse effects to scenery. Under Alternative 5, more area would be harvested in seen areas (approximately 77 acres), but all units would be small and only selective harvest methods would be used. Approximately the same amount of harvest area would be visible from key viewing areas under Alternative 4 (84 acres), but these areas would be somewhat more noticeable

2 Alternatives

because most areas would use clearcut with reserves as the harvest system. Reserve trees would be concentrated in visible areas. More area would be harvested in areas visible from key viewing areas under Alternatives 3 (313 acres) and 2 (446 acres), but most of these areas would be selectively logged.

Currently, one portion of the project area exceeds the visual disturbance threshold established by the Forest Plan. None of the alternatives propose additional harvest in this area. None of the alternatives would cause any of the project area to reach or exceed the allowable visual disturbance threshold.

Preferred Alternative

Alternative 3, the proposed action, is the preferred alternative at this time. This alternative best meets the purpose and need for the project. Alternative 3 would not harvest timber or build roads in the IRA or in unroaded areas. The analysis in the Final EIS indicates that it would not have a significant adverse effect on wildlife habitat, road density would remain about the same, and all new and reopened roads would be closed following harvest activities. This alternative would not significantly change the number of deer per square mile.

This alternative would harvest the most timber (approximately 20 mmbf) of any alternative that does not enter the IRA or unroaded areas. It would have the second lowest cost per mbf. In addition, more than one quarter of the acres would be selectively harvested. All proposed harvest units and roads would meet the Forest Plan Standards and Guidelines, including VQOs for the project area.

Table 2-6
Comparison of Alternatives^{1/}

Effect	Alternative					
	1	2	3	4	5	6
Issue 1: Roadless and Unroaded Areas						
Harvest acres within the IRA #304 (acres) ^{2/}	0	58	0	0	0	0
Miles of new road in the IRA ^{2/}	0	0.6	0	0	0	0
Acres in IRA that would be <600/1200 feet from harvest unit/road	0	312	165	129	0	22
Maximum acres affected in the IRA	0	370	165	129	0	22
Harvest within unroaded areas (acres)	0	63	0	0	0	0
Miles of new road in unroaded areas	0	0.2	0	0	0	0
Issue 2: Wildlife Habitat						
Proposed adjustments to the small OGR (acres)	0	790	790	790	790	790
Acres of productive old-growth forest harvested ^{3/}						
High	0	519	345	228	92	95
Medium	0	331	298	181	136	67
Low	0	98	91	136	113	9
Deer per square mile after harvest	21.5	21.2	21.3	21.4	21.4	21.4
Deer per square mile after 25 years	21.5	21.2	21.3	21.4	21.4	21.4
High-value marten habitat harvested (acres)	0	430	312	218	59	94
Road density (miles/square mile) ^{4/}						
VCU 1170	0	0	0	0	0	0
VCU 1180	0.29	0.29	0.29	0.48	0.29	0.29
VCU 1190	0.61	0.83	0.80	0.70	0.61	0.64
VCU 1200	1.01	1.17	1.15	1.06	1.01	1.01
Total project area	0.46	0.56	0.55	0.55	0.46	0.55
Issue 3: Timber Sale Economics						
Total harvest volume (mmbf)	0	27.4	19.9	14.9	up to 5.0	6.4
Total harvest volume (thousand CCF) ^{5/}	0	54.3	39.8	29.6	up to 9.2	10.0
Average harvest cost (\$/mbf)	-	248.56	248.66	337.14	269.44	206.10
Net stumpage value (\$/mbf)	-	-61.72	-67.42	-166.96	-118.36	-16.50
Employment (job-years)	0	143	105	78	24	26
Road costs (includes reconstruction)		1,016,000	865,000	486,500	85,000	105,000
Issue 4: Harvest Methods^{6/}						
Acres clearcut (with reserves)	0	801	537	554	0	172
Acres single tree selection and group selection	0	177	222	12	367	0
Percent single tree selection and group selection	-	18	29	2	100	0
Issue 5: Scenery						
Harvest areas visible from KVAs (acres) ^{7/}	0	446	313	84	77	34

1/ Refer to Chapter 3 for details and explanations. Watersheds and streams are displayed in Figure 3-21.

2/ IRA – Inventoried Roadless Area as used in the 2003 SEIS to the Forest Plan.

3/ Units also include small areas of non-productive forest and non-forest.

4/ Includes open and closed roads and temporary roads.

5/ Based on NEAT model outputs; these numbers differ slightly from volume in mbf.

6/ Includes productive old-growth forest and small inclusions of other types.

7/ KVA – key viewing area.

2 Alternatives

Table 2-6 (Continued)
Comparison of Alternatives

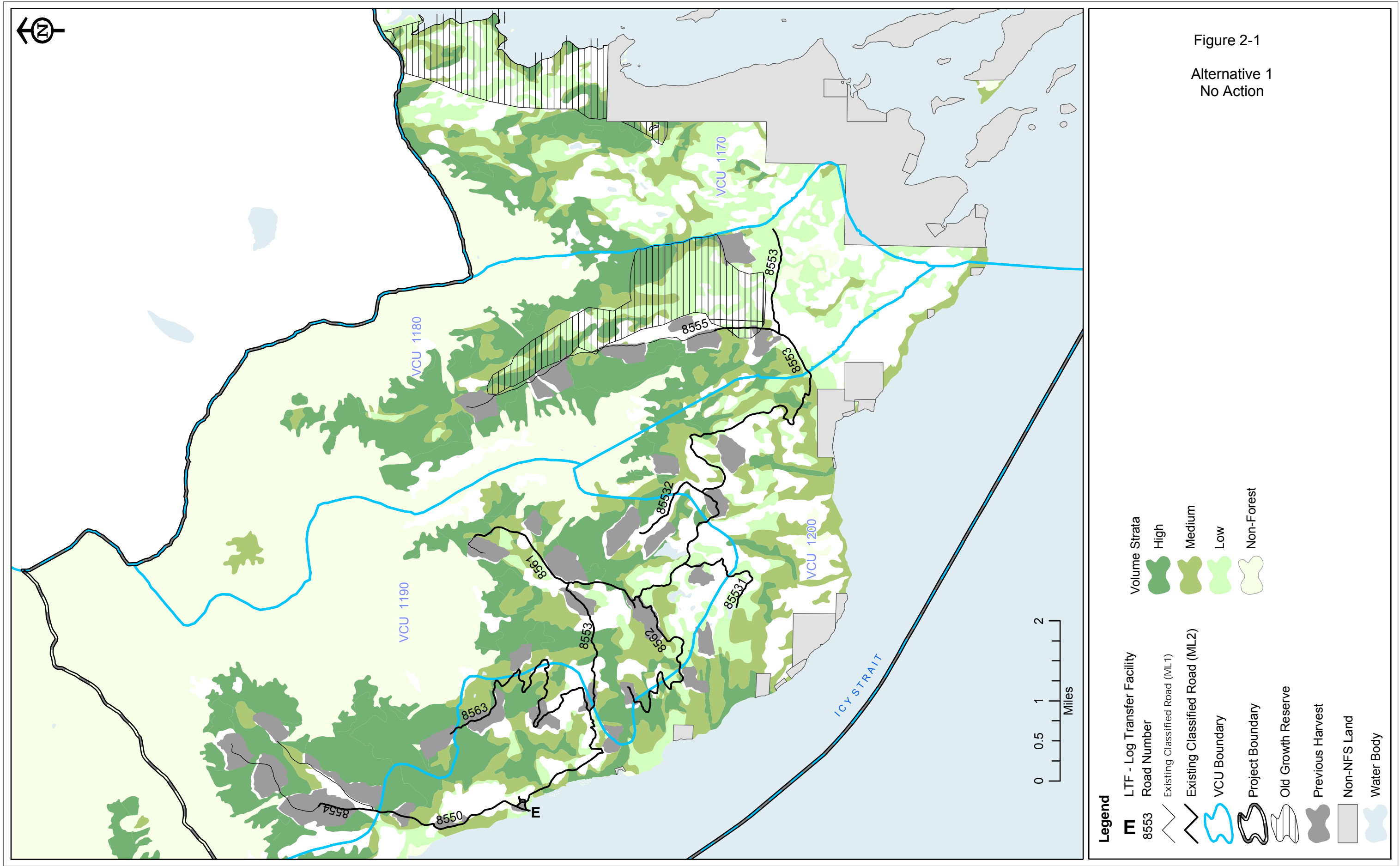
Effect	Alternative					
	1	2	3	4	5	6
Other Environmental Considerations						
Soils						
Harvest-related soil disturbance (acres)	0	54	42	32	21	10
Miles of new classified road	0	4.3	3.4	1.4	0	0.4
Miles of temporary road	0	3.5	3.5	2.6	0	0.5
Miles of closed road reconstructed	0	0	0	2.9	0	0
Road/landing-related disturbance (acres)	0	61	51	32	9	6
Watershed and Fisheries						
Percent cumulative harvest disturbance						
Homeshore watershed	8.5	9.7	9.6	8.5	8.9	8.5
North Group drainage area	6.9	12.1	8.7	7.5	8.2	7.1
Humpy watershed	7.9	15.8	13.9	11.9	9.9	10.3
South Group drainage area	4.7	7.6	8.0	6.9	6.4	5.0
Swanson watershed	3.5	3.5	3.5	4.5	3.8	3.5
Cumulative road/stream crossings						
Class I ^{8/}	7	7	7	10	7	7
Class II	9	9	9	9	9	9
Class III	37	43	42	46	37	38
Class IV	32	40	36	39	32	33
Wetlands						
Wetlands acres clearcut with reserves	0	66	66	75	0	13
Wetland acres with single tree selection and group selection	0	5	11	6	44	0
Classified roads in wetlands (acres)	0	<0.25	<0.25	0	0	0
Temporary roads in wetlands (acres)	0	2.7	3.1	3.5	0	0.3
Cumulative harvest in wetlands (acres)	335 ^{9/}	406	412	416	416	347
Recreation						
Net change in ROS settings (acres) ^{10/}						
Primitive (P)	0	0	0	0	0	0
Semi-primitive Non-motorized (SPNM)	0	-1,220	-755	-368	0	-171
Semi-primitive Motorized (SPM)	0	-116	-298	-618	0	0
Road Natural (RN)	0	0	0	0	0	0
Roaded Modified (RM)	0	1,336	1,053	987	0	171

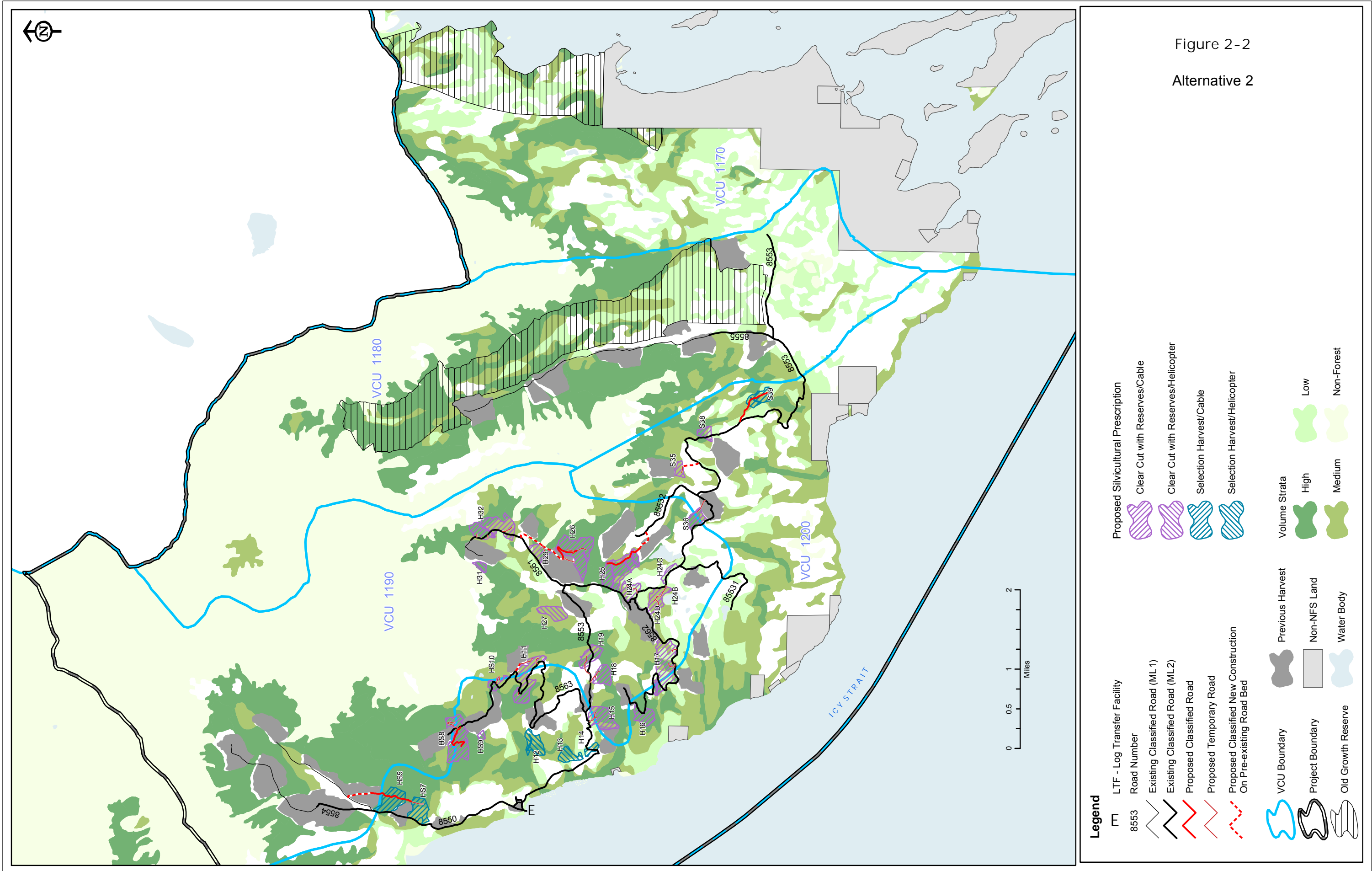
8/ Alternative 4 includes 3 reopened crossings on Road 8555, which would only be reconstructed under Alternative 4.

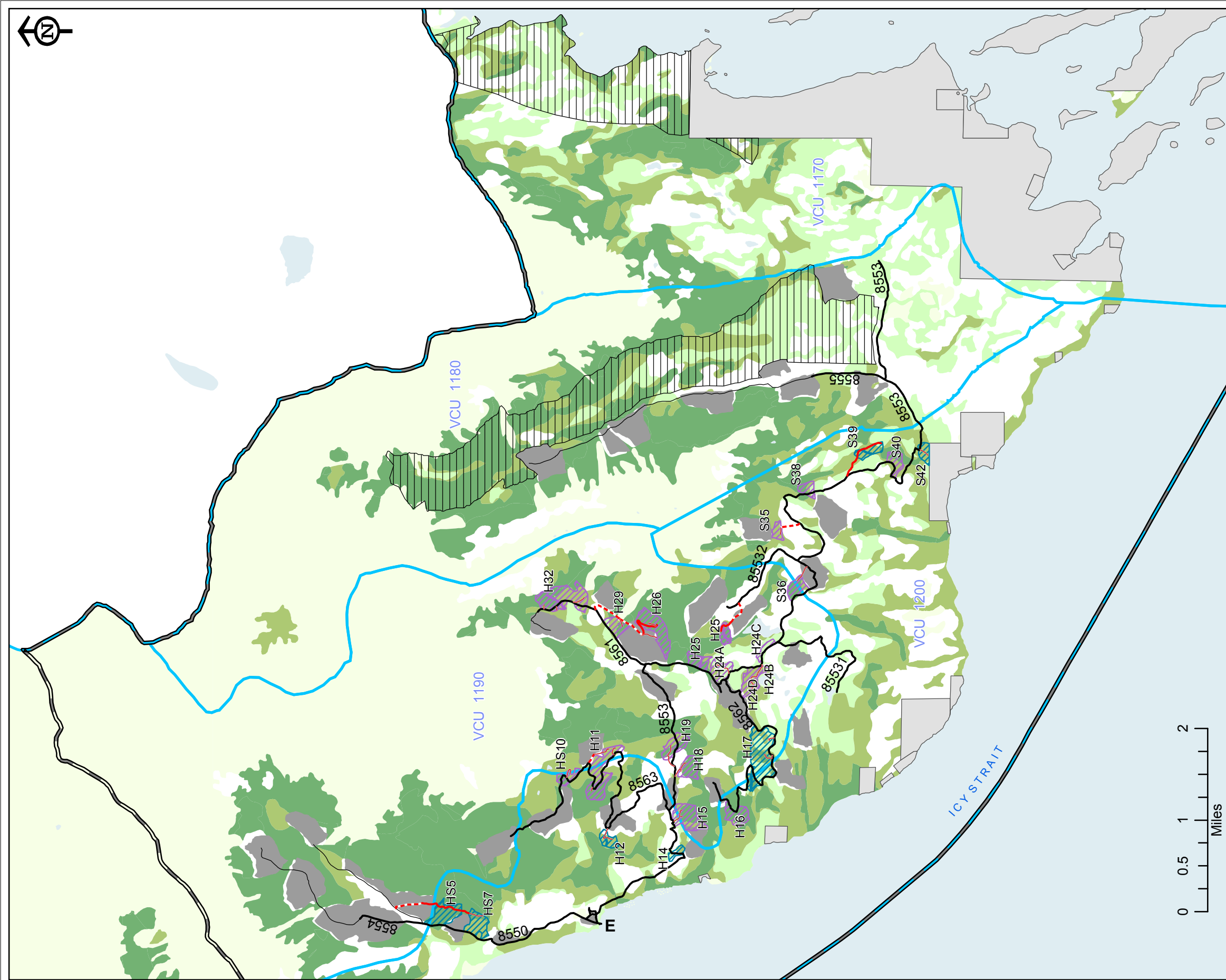
9/ Includes past temporary and classified roads and harvest on wetlands.

10/ ROS – Recreation Opportunity Spectrum

Note: Numbers are not exact due to rounding.



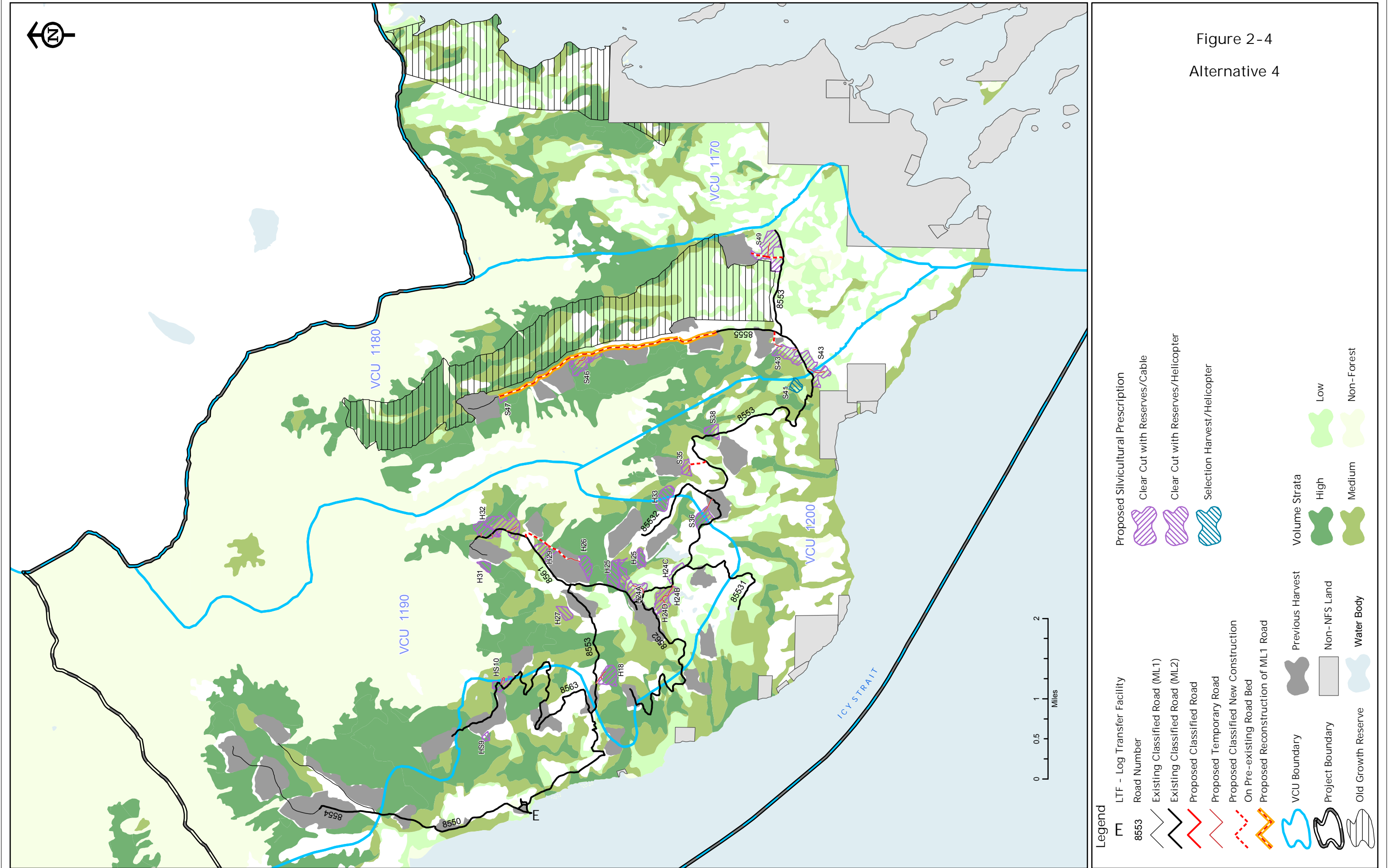


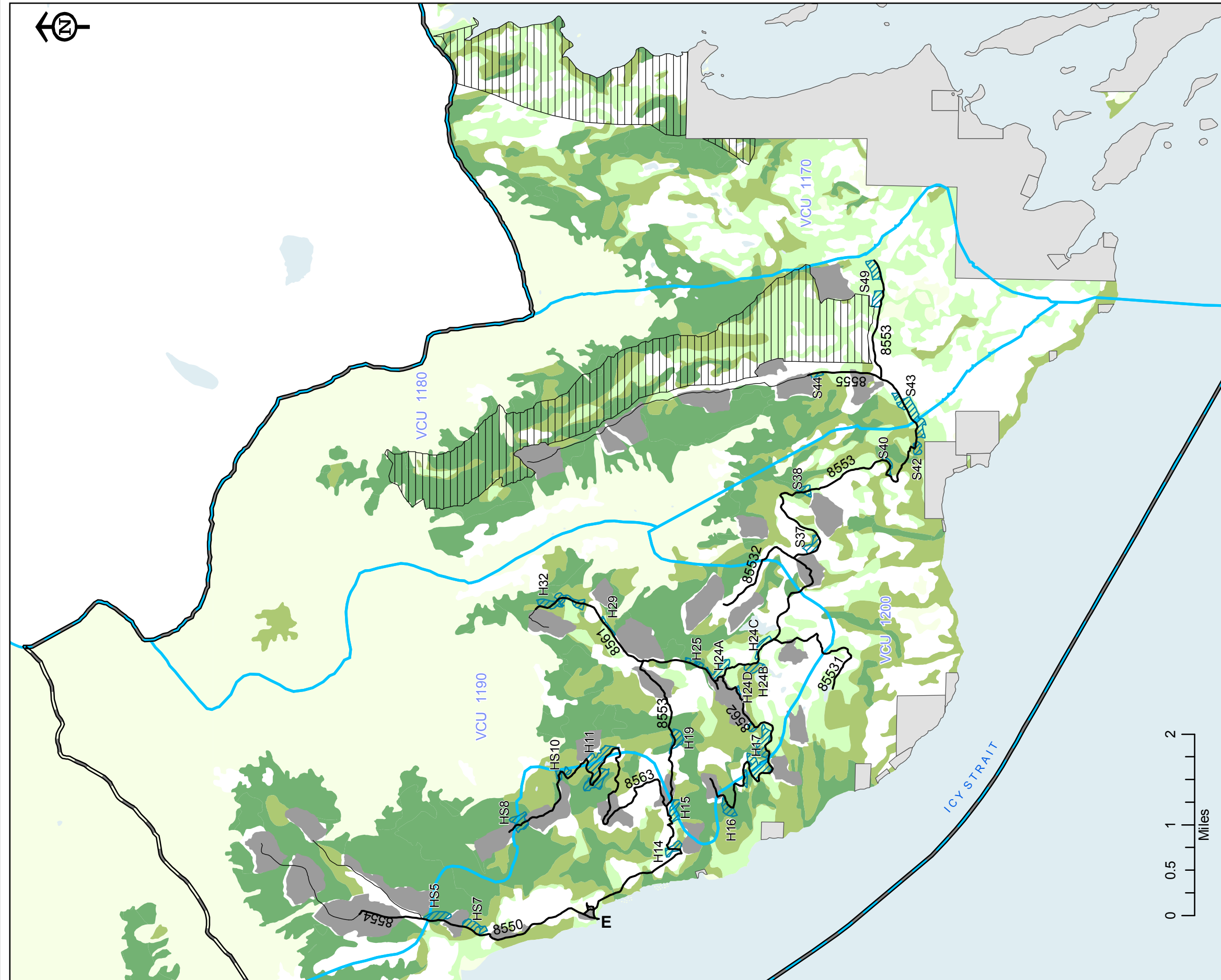


Legend

- LTF - Log Transfer Facility
- Road Number
- Existing Classified Road (ML1)
- Existing Classified Road (ML2)
- Proposed Classified Road
- Proposed Temporary Road
- Proposed Classified New Construction On Pre-existing Road Bed
- VCU Boundary
- Project Boundary
- Old Growth Reserve
- Previous Harvest
- Non-NFS Land
- Water Body
- Proposed Silvicultural Prescription
 - Clear Cut with Reserves/Cable
 - Selection Harvest/Cable
- Volume Strata
 - High
 - Medium
 - Low
 - Non-Forest

Figure 2-3
Alternative 3

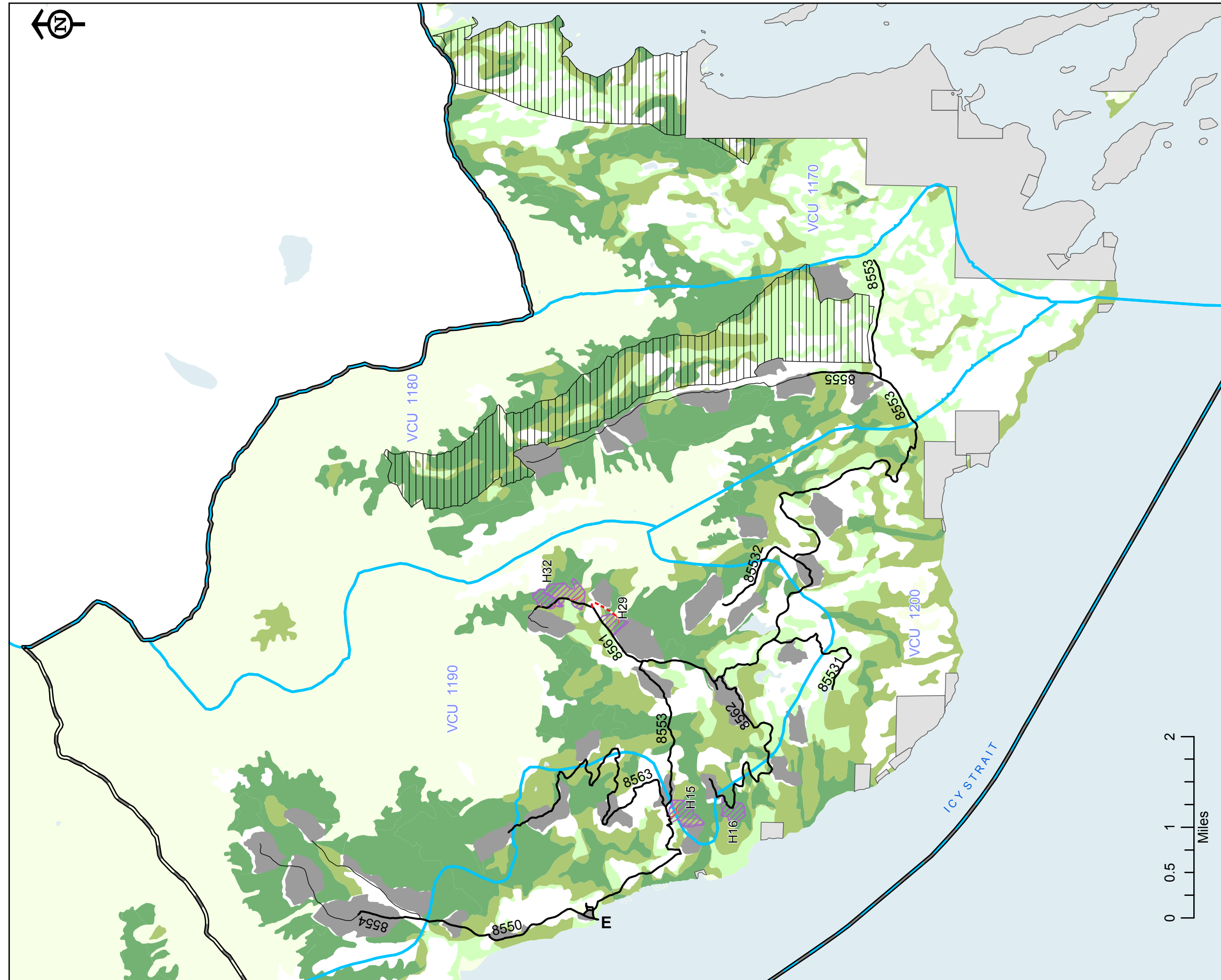




Legend

- LTF - Log Transfer Facility
- Road Number 8553
- Existing Classified Road (ML1)
- Existing Classified Road (ML2)
- VCU Boundary
- Project Boundary
- Old Growth Reserve
- Previous Harvest
- Non-NFS Land
- Water Body
- Volume Strata
 - High
 - Medium
 - Low
- Selection Harvest/Cable

Figure 2-5
Alternative 5



Legend

- | | |
|---|-------------------------------|
| LTF - Log Transfer Facility | VCU Boundary |
| Road Number | Project Boundary |
| Existing Classified Road (ML1) | Old Growth Reserve |
| Existing Classified Road (ML2) | Previous Harvest |
| Proposed Temporary Road | Non-NFS Land |
| Proposed Classified New Construction On Pre-existing Road Bed | Water Body |
| | High Volume Strata |
| | Medium Volume Strata |
| | Low Volume Strata |
| | Clear Cut with Reserves/Cable |
| | Non-Forest |

Figure 2-6
Alternative 6

CHAPTER 3

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Chapter 3

Affected Environment and Environmental Consequences

Introduction

This chapter provides information concerning the existing environment of the Couverden project area and potential consequences to that environment. It also presents the scientific and analytical basis for the comparison of alternatives presented in Chapter 2. Each resource potentially affected by the proposed action or an alternative is described by its current condition and uses.

Following each resource description is a discussion of the potential effects (environmental consequences) to the resource associated with the implementation of each alternative. All significant or potentially significant effects, including direct, indirect, and cumulative effects, are disclosed. Effects are quantified where possible, and qualitative discussions are also included. The means by which potential adverse effects will be reduced or mitigated are described within this chapter (also see Chapter 2 and Appendices B, C, and D).

The discussions of resources and potential effects take advantage of existing information included in the Tongass Forest Plan Revision Final Environmental Impact Statement (EIS), other project EISs, project-specific resource reports and related information, and other indicated sources. Where applicable, such information is briefly summarized and referenced to minimize duplication. The planning record for the Couverden project area includes all project-specific information, including resource reports and other results of field investigations. The record also contains information resulting from public involvement efforts. The planning record is located at the Juneau Ranger District Office in Juneau, Alaska, and is available for review during regular business hours. Information from the record is available upon request.

Land Divisions

The land area of the Tongass National Forest has been divided in several different ways to describe the different resources and allow analysis of how they may be affected by Forest Plan and project level decisions. These divisions vary by resource because the relationship of each resource to geographic conditions and zones also varies. The allocation of Tongass

3 Affected Environment and Environmental Consequences

Forest Plan land use designations (LUDs) (discussed in Chapter 1) is one such division. Two divisions important for the present effects analysis are described briefly below.

Value Comparison Units

Value Comparison Units (VCUs) are distinct geographic areas, each encompassing a drainage basin containing one or more large stream systems. The boundaries usually follow major watershed divides. The Couverden project area consists of all of VCU 1180 and portions of VCUs 1190, 1200, and 1700, as discussed in Chapter 1. Chapter 1 also includes a map showing their location.

Wildlife Analysis Areas

Wildlife Analysis Areas (WAAs) are Forest Service land divisions that correspond to the “Minor Harvest Areas” used by the Alaska Department of Fish and Game (ADF&G). Approximately 190 WAAs apply to the Tongass National Forest. The project area is included in WAAs 2305 and 2306. WAA 2305 includes VCUs 1170 and 1180, as well as non-project area VCUs 1120, 1130, 1140, 1150, and 1160. WAA 2306 includes VCUs 1190 and 1200, as well as non-project area VCUs 1210, 1220, and 1230. Information estimated by WAA is used in the wildlife and subsistence analyses.

Analyzing Effects

Environmental consequences are the effects of implementing an alternative on the physical, biological, social, and economic environment. The Council on Environmental Quality (CEQ) regulations implementing the National Environmental Policy Act (NEPA) include a number of specific categories to use for the analysis of environmental consequences. Several are applicable to the analysis of the proposed project and alternatives, and form the basis of much of the analysis that follows. They are explained briefly here.

Direct, Indirect, and Cumulative Effects

Direct environmental effects are those occurring at the same time and place as the initial cause or action. Indirect effects are those that occur later in time or are spatially removed from the activity, but would be significant in the foreseeable future. Cumulative effects result from incremental effects of actions, when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative effects can result from individually minor, but collectively significant, actions taking place over a period of time.

Reasonably foreseeable effects for the project area include this project, precommercial thinning in older harvest units, road maintenance (including improving fish passage), and recreational use of the road system. There are no reasonably foreseeable actions on state and private lands in the project area. Approximately nine sections of land in the southern part of the project area have been selected by the Huna Totem Corporation (see page 1-9 and Figure 1-3). The Huna Totem Corporation, however, has overselected land and may not choose to receive all or part of the selected land in the project area. At this time, any activities connected with non-federal management of these lands is speculative.

Affected Environment and Environmental Consequences 3

Unavoidable Adverse Effects

Implementation of any action alternative would cause some adverse environmental effects that cannot be effectively mitigated or avoided. Unavoidable adverse effects often result from managing the land for one resource at the expense of the use or condition of other resources. Many adverse effects can be reduced, mitigated, or avoided by limiting the extent or duration of effects. The interdisciplinary procedure used to identify specific harvest units and roads was designed to eliminate or lessen the significant adverse consequences. The application of Forest Plan Standards and Guidelines, Best Management Practices (BMPs), project-specific mitigation measures, and monitoring are all intended to further limit the extent, severity, and duration of potential effects. Such measures are discussed throughout this chapter. Regardless of the use of these measures, some adverse effects will occur. One purpose of this chapter is to fully disclose these effects.

Short-term Use and Long-term Productivity

Short-term uses, and their effects, are those that occur annually or within the first few years of project implementation. Long-term productivity refers to the capability of the land and resources to continue producing goods and services long after the project has been implemented. Under the Multiple-Use Sustained-Yield Act and the National Forest Management Act (NFMA), all renewable resources are to be managed in such a way that they are available for future generations. The harvesting and use of standing timber can be considered a short-term use of a renewable resource. As a renewable resource, trees can be re-established and grown again if the long-term productivity of the land is maintained. This long-term productivity is maintained through the application of the resource protection measures described in Chapter 2, in particular those applying to the soil and water resources. These are also discussed throughout this chapter, in particular for soils.

Irreversible and Irretrievable Commitments

Irreversible commitments describe a loss of future options. Irreversible applies primarily to the effects of use of nonrenewable resources such as mineral extraction or destruction of a cultural resource site. Once these resources are gone, they cannot be replaced. Irreversible can also apply to factors such as soil productivity that are renewable only over long periods of time.

Irretrievable commitments apply to the loss of production, harvest, or use of natural resources. For example, some or all of the timber production from an area is lost irretrievably while an area is serving as a winter sports site. The production lost is irretrievable, but the action is not irreversible because if the use changes, it is possible to resume timber production.

The use of these terms to include in discussions of environmental consequences is found in 40 CFR 1502.16. The definitions above are found in the Forest Service handbook (FSH 1909.15, 05). The disclosure of effects that follows is organized by direct, indirect, and cumulative effects. Where necessary, irreversible commitments are identified, but timber harvest and associated activities are generally considered irretrievable commitments of resources.

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Available Information

Much of the Tongass National Forest resource data resides in an electronic database formatted for a geographic information system (GIS). The Forest uses GIS software to assist in the analyses of these data. GIS data are available in tabular (numerical) format and as plots displaying data in map format. For this EIS, all the maps and most of the numerical analyses are based on GIS resource data. The GIS database for the project area was updated using LiDAR (a laser-based technique for developing detailed topographic information) and the information gathered during field work in 2002.

There is less than complete knowledge about many of the relationships and conditions of wildlife, fish, forests, jobs, and communities. The ecology, inventory, and management of a large forest area is a complex and developing science. The biology of wildlife species prompts questions about population dynamics and habitat relationships. The interaction of resource supply, the economy, and communities is the subject matter of an inexact science. The basic data and central relationships, however, are sufficiently well established in the respective sciences for the deciding official to make a reasoned choice between the alternatives, and to adequately assess and disclose the possible adverse environmental consequences. New or improved information would be very unlikely to reverse or nullify these understood relationships.

Other Resources

Several resources and uses of the project area are likely to remain unaffected by the proposed action or alternatives, or will not be affected to a significant degree. Even though significant effects are not anticipated, most of these resources are discussed in the sections of this chapter to the extent that measurable effects or differences between alternatives are present. Resources or uses for which no measurable effects were identified are discussed briefly below.

Air Quality

All of the action alternatives will have limited, short-term effects on ambient air quality. Such effects, in the form of vehicle emissions and dust, are likely to be indistinguishable from other local sources of airborne particulates, including other motor vehicle emissions, dust from road construction and motor vehicle traffic, residential and commercial heating sources, marine traffic, and emissions from burning at sawmills. The action alternatives could result in short-term supplies of raw wood products to local mills. It is the responsibility of the mill owner or sort yard operator to ensure that mill emissions are within legal limits.

Facilities

No logging camps or Forest Service administrative sites are located in the Couverden project area. The Juneau Ranger District is located approximately 30 miles east of the project area in Juneau, Alaska.

Minerals

No known mineral occurrences of commercial value are within the Couverden project area. Field investigations by the US Bureau of Mines have located no mines or high-grade mineral deposits. Bureau of Land Management records indicate no active mining claims or patented mining claim groups within the Couverden project area.

The proposed action would have no direct or indirect effect on mineral resources. In general, the project would affect mining activities only by

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providing easier access for mapping and surveying due to new road construction in less developed or underdeveloped areas. Geologic mapping would also be enhanced by increased exposure due to road construction and quarry development.

Plans of Other Agencies

The CEQ regulation implementing NEPA requires a determination of possible conflicts between the proposed action and the objectives of federal, state, and local land use plans, policies, and controls for the area. The major land use regulations of concern are Section 810 of the Alaska National Interest Lands Conservation Act (ANILCA), the Coastal Zone Management Act (CZMA), and the State of Alaska's Forest Practices Act. See the *Findings and Disclosures* section of this chapter for a discussion of compliance with these laws. ANILCA Section 810 requirements pertain to subsistence. These are also discussed in the *Subsistence* section of this chapter.

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Issue 1: Road Construction and Timber Harvest in Roadless and Unroaded Areas

Inventoried roadless areas (IRAs) are defined as undeveloped National Forest System (NFS) land, typically exceeding 5,000 acres, that meet the minimum criteria for wilderness consideration under the Wilderness Act. IRAs are lands that were inventoried during the Forest Service's Roadless Area Review and Evaluation (RARE II) process, subsequent assessments, or forest planning. These areas in the NFS possess values and characteristics that are becoming increasingly scarce as lands are developed. Roadless areas provide large, undisturbed landscapes that offer privacy and solitude, unique areas for recreation, and sources of clean drinking water. They conserve biological diversity, protect areas against spread of invasion of non-native species, and provide opportunities for study, research, and education. The proposed Couverden Timber Sale analysis area is adjacent to and partially within the Chilkat-West Lynn Canal IRA. The project area also includes smaller unroaded areas, areas less than 5,000 acres. For this analysis, these are defined as areas more than 1,200 feet from a road and/or more than 600 feet from the edge of a clearcut harvest unit.

Forest Plan and Management of IRAs

In February 2003, the Final Supplemental Environmental Impact Statement (SEIS) and Record of Decision (ROD) was published to supplement the 1997 Tongass Land Management Plan Revision Final EIS. It evaluates alternatives for recommending Tongass National Forest IRAs for wilderness designation by Congress. The 109 inventoried roadless areas on the Tongass were updated and evaluated using information and mapping that best reflects current conditions. It was decided to not recommend additional acreage for designation as wilderness. The inventoried roadless areas and resources will continue to be managed under the direction of the current Forest Plan.

For this analysis, all areas more than 1,200 feet from a road and/or more than 600 feet from a clearcut were considered either roadless (if more than 5,000 acres) or unroaded areas (Figure 3-1).

The Roadless Area Conservation Rule (Roadless Rule, January 2001) generally prohibited timber harvest and road construction in IRAs on NFS lands. In July 2003, the U.S. District Court for the District of Wyoming set aside the Roadless Rule and permanently enjoined its implementation. Under the current injunction, the Roadless Rule is not in effect. This project is consistent with current agency policy and has been designed to meet management direction (goals and objectives, standards and guidelines) in the Forest Plan.

Affected Environment

The Tongass National Forest encompasses approximately 16.8 million acres, of which 6.6 million (39 percent) are designated wilderness, national monument, or LUD II (roadless) lands; 5.8 million of these acres are wilderness. IRAs make up approximately 9.6 million acres (57 percent) of the Tongass National Forest (as inventoried in the SEIS to the Forest Plan). Approximately 2.5 million (or 26 percent) of those acres are managed in moderate or intensive development land use designations (LUDs). The Chilkat-West Lynn Canal IRA covers 198,109 acres (or 1 percent) of the Tongass National Forest with 23 percent of the area managed under moderate or intensive development LUDs.

A portion of the project analysis area, 61 percent, is in the Chilkat-West Lynn Canal IRA. The portion of the project area that is within the IRA is divided between development LUDs (Timber Production and Semi-remote Recreation) that allow timber harvest and road building and non-development LUDs (Old-growth Forest and Semi-remote Recreation) that does not allow harvest or road building. Table 3-1 shows the acreage of the project area that is within the IRA by management LUD.

Eight unroaded areas that are smaller than the minimum size (generally 5,000 acres) for IRAs are also in the proposed project area. They account for approximately 2,989 acres in the project analysis area. The largest is the undeveloped land along the coast that accounts for about 80 percent of the unroaded area acreage.

Table 3-1
Management LUDs within Chilkat-West Lynn Canal IRA^{1/}

LUD	Chilkat-West Lynn Canal IRA (#304) ^{2/}	Coueverden Project Area within IRA #304 ^{2/}
Non-development LUDs		
Semi-remote Recreation	138,819	8,469
Old-growth	13,066	2,988
Development LUDs		
Scenic Viewshed	31,003	4,857
Timber Production	15,221	14,201
Total Acreage	198,109	30,515

1/ IRA as inventoried in the SEIS to the Forest Plan.

2/ Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

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Summary of the Forest Plan Revision Final SEIS Description of the Chilkat-West Lynn Canal Inventoried Roadless Area (#304)

The Chilkat-West Lynn Canal Roadless Area is 1 of 109 roadless areas analyzed in the 2003 Tongass SEIS. It is primarily on the mainland and includes a few islands. Covering 198,109 acres, it is part of a much larger roadless area that extends from the northern National Forest boundary at Point Sullivan to the southern tip of the Chilkat Peninsula at Point Couverden. This larger roadless area also includes the Endicott Wilderness and the Sullivan Roadless Area (#303), and is adjacent to Glacier Bay National Park and Preserve. The Chilkat-West Lynn Canal Roadless Area is characterized by rugged topography and contains the Chilkat Mountain Range running north-south through the Chilkat Peninsula. The southern coastline is for the most part gently rolling and forested terrain. There are numerous areas of low to medium vulnerability karst, which is mapped as covering approximately 10 percent of the area.

The roadless area is entirely within the Glacier Bay Fjordlands Ecological Section and the Chilkat Peninsula Carbonates Ecological Subsection. The roadless area covers 57 percent of the ecological section and 59 percent of the subsection. Both the section and subsection are well represented by existing wilderness (28 and 26 percent, respectively).

The southern end of the Chilkat Peninsula has documented prehistoric sites. The Tlingit tribes were the primary inhabitants. A number of native facilities and uses have been identified, such as cemeteries, villages, and cabin/smokehouses. More recently, mining, hunting, and timber sales have occurred. The timber sales are outside of and adjacent to the roadless area.

The roadless area has high scenic quality with mostly natural appearing landscape that provides a scenic backdrop for cruise ships and state ferries on Lynn Canal, Icy, and Chatham Straits. It is reasonably close to Juneau (25 miles) and has a number of all-weather anchorages within or adjacent to the area. It has great potential to provide a wide variety of recreation opportunities given the high wildlife values, rugged interior, and imposing scenery.

The Chilkat-West Lynn Canal Roadless Area was given a Wilderness Attribute Rating System (WARS) Score of 25 of a possible 28 points for the Forest Plan SEIS in 2003. It ranked 12th from the highest (along with 12 others) among 109 Tongass IRAs.

The Chilkat-West Lynn Canal Roadless Area was allocated by the Forest Service into four LUDs to which specific management direction is applied (USDA Forest Service 1997a). Most of the roadless area was designated to non-development LUDs, Semi-remote Recreation (70 percent), and Old-growth Habitat (7 percent) that do not allow timber harvest or road development. The remaining 23 percent was allocated to Scenic Viewshed (15 percent) and Timber Production (8 percent). The acres in Roadless

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Area #304 that were allocated to development LUDs are located in the southwest portion of the roadless area, in the proposed project area, and in the northeast by St. James Bay.

The roadless area includes approximately 82,300 acres mapped as forested land, of which 47,442 acres (or 58 percent) are mapped as productive old-growth forest. Approximately 32,898 of these acres are mapped as tentatively suitable for timber production. Based on the Forest Plan management LUDs, 5,981 acres (or 3 percent) of the roadless area are estimated to be suitable for timber management.

For a more extensive description of Chilkat-West Lynn Canal Roadless Area, see the Tongass Land Management Plan Revision Final SEIS (USDA Forest Service 2003).

Evaluation of the Chilkat-West Lynn Canal Inventoried Roadless Area

The values discussed below were identified as key characteristics of roadless areas.

Proximity to Other Roadless Areas

The Chilkat-West Lynn IRA extends south from the Endicott River Wilderness and is partially bordered to the west by Glacier Bay National Park and Preserve. It is separated from Sullivan Roadless Area (#303) to the north by a narrow area of harvest along the Endicott River. Several stretches of the roadless area coastline are developed or state-owned land.

Proximity to Non-National Forest Land That Could be Developed

There are parcels of State-owned and private land along the shore, some of which are adjacent to Chilkat-West Lynn Canal Roadless Area (Figure 3-1). There are no known plans to further develop these areas.

Amount of Human Disturbance—Past, Present, and Future

There is a special use permit for a recreation cabin on Teardrop Creek and two for radio sites—one near Point Howard and one near William Henry Bay. The Forest Service has a radio repeater on William Henry Peak. There are no public recreation facilities within this area and recreation remains primarily dispersed, with the majority of use occurring along the coastline.

The roadless area is largely unmodified and, therefore, maintains its natural integrity and apparent naturalness very well. The level of past disturbance has primarily been related to timber harvest in adjacent areas, including north of St. James Bay State Marine Park, in the area separating Chilkat-West Lynn Canal Roadless Area from Sullivan Roadless Area, and earlier harvest in the proposed Couverden Timber Sale Area. The primary effect of these past timber activities is visual.

The 1997 Juneau Access Draft EIS prepared by the U.S. Department of Transportation, Federal Highway Administration, and state of Alaska Department of Transportation and Public Utilities evaluated one route along the west side of the Lynn Canal in the Chilkat-West Lynn Canal Roadless Area. The project, however, was not pursued. A new EIS is planned that will re-evaluate transportation options, including Juneau to Skagway and

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Juneau to Haines road routes, as well as a ferry route with no road connections.

Following the proposed harvest, additional human activities that could affect the IRA include precommercial thinning in older harvest units outside the IRA boundaries in the Couverden project area. The thinning is in areas of past harvest. No other known projects are proposed in the project area for the next 10-year planning period.

Biological Values

The biological values of Chilkat-West Lynn Canal Roadless Area are typical of Southeast Alaska. Many streams in this area support runs of Dolly Varden char and steelhead and cutthroat trout. The area was not identified as a primary salmon producer or sport fish producer in the SEIS (USDA Forest Service 2003). Boat Harbor and St. James Bay, outside the IRA, were rated as highly valued estuaries.

This roadless area commonly supports mountain goats, black and brown bear, Sitka black-tailed deer, bald eagles, wolves, and moose. Sea lion and seal rookeries and haul outs are found throughout the area along the coastline.

The only federally listed threatened or endangered species likely to occur within or adjacent to the roadless area are the humpback whale (endangered) and the Steller sea lion (threatened), both of which are found in adjacent marine waters. No listed fish species are known to occur in any streams in the project area. Some listed species, however, may be found in the outer marine waters to the west of the Tongass National Forest. Three Forest Service Region 10 Sensitive Species are suspected or known to occur within the area, including the trumpeter swan, Peale's peregrine falcon, and the Queen Charlotte goshawk. Trumpeter swans nest in the lowlands on small lakes and along large rivers and winter in ice-free areas throughout the Tongass. Peale's peregrine falcons nest on cliff faces and islands and feed primarily on seabirds. Inhabitants of late seral forests, Queen Charlotte goshawks are closely associated with productive old growth. In addition, eight sensitive plant species are known or suspected to occur in the Juneau Ranger District.

Recreation Values

The complex of alpine tundra, scrub and old-growth forest, numerous small lakes, snowfields, steeply walled glacial valleys, and waterfalls offer a variety of attractions and features of interest. No public recreation facilities are within this area, and recreation remains primarily dispersed, with the majority of use occurring along the coastline. Hunting, fishing, and pleasure boating adjacent to the roadless area are the most popular pursuits. All-weather anchorages and interesting coves and beaches within the Point Couverden/St. James Bay area offer opportunities for beachcombing, camping, and picnicking. The Point Couverden area is managed by the state. Inland recreation activities include mountain biking and hunting, specifically in the homeshore area where guides use existing roads. The upland areas are remote and receive little recreation use. The potential for solitude is affected along the shore of the area by the substantial boating activities and flight corridors. In 1996, the Alaska Visitors Association proposed the following for the IRA: a leased proprietary camp in Excursion Inlet; a backcountry recreation lodge; leased

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Cultural or Historical Values

proprietary camps; and boardwalks, trails, and paths for the Endicott River (USDA Forest Service 2003).

The southern end of the Chilkat Peninsula has been suitable for human occupation for thousands of years, and documented prehistoric sites have been recorded here. One of the earliest recorded archaeological sites in Alaska is within the greater project area and is radiocarbon dated between 10,180 and 9,130 years ago. This is one of only six sites in Alaska that define the earliest prehistoric period in Alaska and is representative of the first 5,000 years of cultural chronology developed for Alaska.

The cultural affiliation of the people who occupied the earliest components of the oldest sites is not known. The cultural patterns that we recognize as Tlingit are not well documented in the archaeological record until the Developmental Northwest Coast Stage, dating from about 5,000 years ago, and possibly represent the Tlingit entry into this area. The Tlingit were the primary inhabitants of the area until the mid- to late-1800s when increasing mining, fishing, and logging industries brought more Euroamericans into the area.

More recent history includes mining activities, significant black bear and mountain goat hunting in the southern Chilkat area, and three timber sales in the adjacent area.

Two areas in the IRA along Chatham Strait were included among the highest value community use areas in the Tongass Fish and Wildlife Resource Assessment and subsistence use in the St. James Bay area has a high sensitivity to disturbance (USDA Forest Service 2003).

Research Values

No known special features are located in the IRA. The proximity to Juneau, however, would make it a convenient area for educational use or scientific research.

Other Unroaded Areas

Smaller unroaded areas also occur within the project area (Figure 3-1). The largest of these lies along the shore and is generally characterized by low volume forest and wetland.

Environmental Consequences

Alternative 2 is the only alternative that proposes to harvest or build roads within the roadless area boundaries (Figure 3-1). Approximately 58 acres (or 6 percent) of the 978 acres proposed for harvest in Alternative 2 are in the roadless area. Additionally, 0.6 mile of classified roads are proposed to be built in the roadless area along its edge.

IRAs on the Tongass National Forest were mapped to be 600 feet from the edge of clearcuts and 1,200 feet from roads. The proposed alternatives include actions that will reduce the size of some of the strips of land separating the IRA from harvested areas or roads. Table 3-2 shows the acreage of the IRA that would no longer be 600 feet from a clearcut or 1,200 feet from a road.

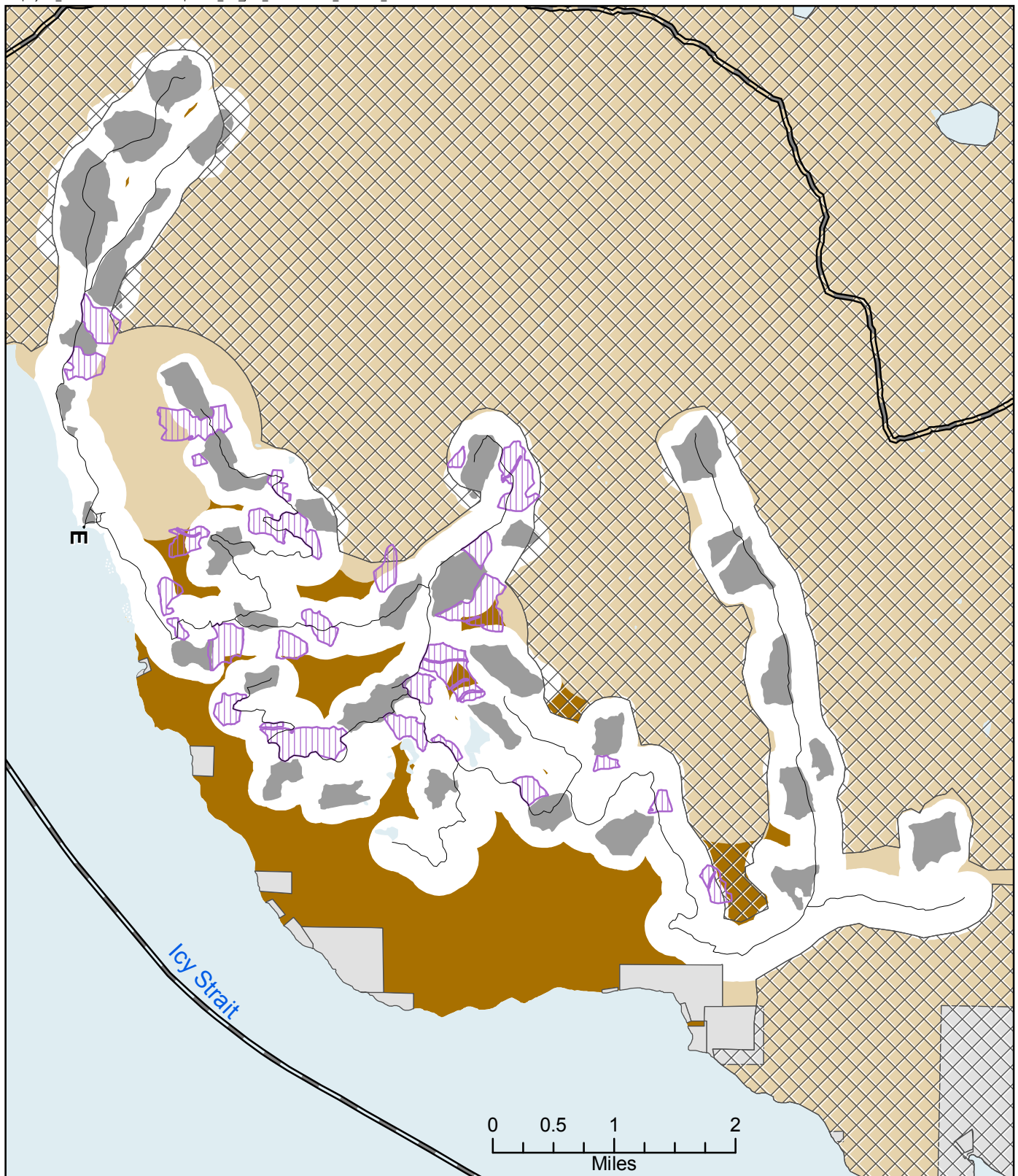


Figure 3-1
SEIS Roadless and Unroaded Areas and Roadless Rule IRA

- Legend
- | | | |
|-------------------------------------|-------------------|------------------|
| LTF - Log Transfer Facility | Previous Harvest | Water Body |
| Existing Classified Road | Unroaded Area | Non-NFS Land |
| Alternative 2 Proposed Harvest Unit | Roadless Rule IRA | Project Boundary |
| SEIS Inventoried Roadless Area | | |



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Table 3-2
Effects on Chilkat-West Lynn Canal IRA by Alternative

Effect	Alternative ^{1/}					
	1	2	3	4	5	6
Proposed harvest acres	0	978	759	566	367	172
Harvest acres within the IRA #304 (SEIS)	0	58	0	0	0	0
Harvest acres in mapped Roadless Rule IRA	0	19	0	0	0	0
Miles of new road in the IRA (SEIS)	0	0.6	0	0	0	0
Miles of new roads in Roadless Rule IRA	0	0	0	0	0	0
Maximum acres affected in the (SEIS) IRA	0	370	165	129	0	22

^{1/} Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

Eight small unroaded areas (referred to as unroaded areas) are within the project area, totaling approximately 2,989 acres. Alternative 2 proposes harvest in 63 of these unroaded acres and construction of 0.2 mile of classified road and less than 0.1 mile of temporary roads within the unroaded areas. No legal prohibitions restrict harvest or road construction in these areas. No other alternative harvests or constructs roads in the unroaded areas.

Alternative 1

No harvest activities or road construction are proposed for Alternative 1. There will be no effect on the Chilkat-West Lynn Canal Roadless Area or unroaded areas.

Alternative 2

Alternative 2 is the only alternative proposing actions that would build roads or harvest timber within Chilkat-West Lynn Canal Roadless Area. Approximately 19 acres would be within the mapped roadless area (58 acres would be within the area considered roadless in the SEIS to the Forest Plan). Alternative 2 would also result in the most acreage (312 acres) that would be less than 600 feet from timber harvest or 1,200 feet from a road. If the roadless area is redrawn at a future roadless inventory, 370 acres would be within 600 to 1,200 feet of harvested area. This is less than 0.1 percent of the Chilkat-West Lynn Canal Roadless Area. All of the proposed harvest and road construction would be done in development LUDs and according to the Forest Plan Standards and Guidelines. Alternative 2 also proposes harvest and road construction in the unroaded areas. It would result in a reduction of the unroaded area of approximately 63 acres, or 2 percent.

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Alternatives 3, 4, and 6

Alternatives 3, 4, and 6 have similar effects. Neither alternative proposes harvest or road construction in the IRA. Under all three alternatives, there would be acres in the IRA that would no longer be 600 feet from a timber harvest or 1,200 feet from a road. Approximately 165 acres would be affected in Alternative 3, 129 acres in Alternative 4, and 22 acres in Alternative 6. That accounts for less than 0.1 percent of the IRA in all three alternatives.

These alternatives do not propose harvest or road construction in the unroaded areas.

Alternative 5

Alternative 5 does not propose harvest or road construction in the Chilkat-West Lynn Canal Roadless Area or the unroaded areas. Harvest in Alternative 5 is limited to selection cutting within 500 feet of existing open roads; this would not result in additional areas that are less than 600 feet from timber harvest or 1,200 feet from a road. Thus, Alternative 5 would not have an effect on the size of the roadless area or on unroaded areas.

Summary

The effects of the proposed alternatives would be in areas very close to the edge of Roadless Area #304 (as identified in the SEIS to the Forest Plan). The alternatives do not affect outstanding features noted above in the description of the roadless area or eligibility for wilderness designation. They also do not significantly alter the biological, recreational, or cultural and historic values noted above, or eligibility for wilderness designation. The effect to the roadless area is minimal due to the relatively low acreage affected by the alternatives and the location at the edge of a developed area. For Alternative 2, the only alternative that would harvest in the IRA, the acreage disturbed is less than 1 percent of the IRA. For Alternatives 3, 4, and 6, logging within 1,200 feet of the IRA affects less than 0.1 percent of the roadless area.

The primary effect on the roadless area would be that of creating visual disturbance in the viewshed for areas close to the proposed harvest units (refer to Issue 5). The area has existing clearcuts that are in various stages of regrowth and the proposed actions would add additional visual disturbance. This could reduce the pleasure of people recreating in the immediate area. The effects on recreation are discussed further in the *Recreation* section.

Cumulative Effects

The boundaries of the IRA used in the SEIS to the Forest Plan were mapped to exclude areas that have been disturbed by harvest and road building. The edges are 600 feet from the edge of a clearcut and 1,200 feet from the edge of a road; therefore, the IRA does not include past activities of

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that type. Nearly 11,000 acres of roadless area within the project area has been converted to roaded since 1979, which is the year road construction began. An additional 58 acres would be converted to a roaded condition under Alternative 2.

Foreseeable future projects in the Couverden project area include installation of a small boat dock and boat ramp and road maintenance. These projects are not within the IRA and would not affect any future roadless area inventory. No other known projects are proposed in the project area for the next 10-year planning period.

No significant cumulative effects on the Chilkat-West Lynn Canal Roadless Area are anticipated from any of the proposed alternatives due to the relatively low acreage affected by the alternatives.

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Issue 2: Wildlife Habitat

The effects of timber harvest and road construction on wildlife habitat in the project area is a key issue raised during the scoping by members of the public and representatives from other agencies. This section discusses the effects of the proposed alternatives on wildlife habitats, fragmentation and connectivity, and wildlife species of concern documented or expected to occur within the project area. Threatened, endangered, and sensitive (TES) species are addressed separately (see the *Other Environmental Considerations* section). No threatened and endangered wildlife species are present on the Tongass, and there is a “no jeopardy opinion” by the federal regulatory agencies regarding the full implementation of the Forest Plan. Additional details on these resources can be found in the Wildlife Resource Report (Foster Wheeler Environmental 2003a) in the project planning record.

Habitat Types

Habitat provides the essentials—food, water, and cover—that a species needs to survive and reproduce successfully. To maintain viable populations of wildlife species, adequate resources and environmental conditions must be available for reproduction, foraging, resting, cover, and dispersal of animals at a variety of scales across space and time. These resources must be distributed in such a way as to allow breeding individuals to interact within and among populations (Morrison et al. 1992). Wildlife species select habitat on the basis of microclimate, physiography (i.e., slope, elevation, and aspect), prey densities, protection from predators, and a variety of vegetative features.

A species that uses a range of habitat types showing no distinct habitat preference is considered a habitat generalist, while a species that uses one distinct habitat type is considered a habitat specialist. Because of their relative flexibility with respect to habitat use, generalist species are often more tolerant of natural or human-induced changes in habitat, while specialist species typically respond adversely to rapid habitat changes.

Wildlife habitats in the project area are described using data contained in the Forest Service geographic information system (GIS) layers. The GIS database was developed based on timber stand exams, aerial photo interpretation, and field studies. Wildlife habitats in the project area include beach and estuary fringe, wetlands, riparian areas, old-growth forest, and other non-forest habitats. Table 3-3 shows the habitat types and acreages found within the Couverden project area, broken out by Value Comparison Units (VCUs).

Beach and Estuary Fringe

Beach and estuary fringe represents the area within 1,000 feet of the coastal zone that is transitional between land and water, salt and fresh water, and vegetated and non-vegetated conditions. Forested areas in this transition zone typically receive high use by species with high economic, recreational, subsistence, and aesthetic values. These species include black bear, river otter, bald eagle, black-tailed deer, American marten, and Vancouver Canada goose. Many of these species are abundant in mature and

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Table 3-3
Acres within Each VCU Habitat Type, Volstrata, Beach and Estuary Fringe
found in the Couverden Project Area

	VCU				Total Acres within the Project Area ^{1/}
Habitat Type	1170	1180	1190	1200	
Timber Volume Strata ^{2/} /Acre					
High					
30-50+ mbf	1,750	2,819	3,332	1,791	9,692
Medium					
20-30 mbf	2,304	926	1,114	2,756	7,100
Low					
8-20 mbf	2,836	1,389	418	1,286	5,929
Non Productive					
0-8 mbf	3,391	2,176	2,560	3,467	11,594
Total Productive Forest Acres	6,890	5,134	4,864	5,833	22,721
Total Forested Acres	10,281	7,310	7,424	9,300	34,315
Non-Forested Lands					
Rock	44	19	268	0	331
Ice/Snowfield	0	0	6	5	11
Alpine	571	4,229	3,780	235	8,815
Brush and Alder	101	2,063	3,325	135	5,624
Grassland	61	24	0	0	85
Muskeg Meadow	129	89	0	37	255
Recurrent Slide Zones	0	0	29	0	29
Fresh Water	0	0	37	6	43
Other	0	0	0	14	14
Total Non-Forested Acres	906	6,424	7,447	432	15,207
Total Acres by VCU	11,187	13,734	14,869	9,732	49,522
Beach and Estuary Fringe	2,292	0	0	1,192	3,484

^{1/} Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding. Numbers are not exact due to rounding.

^{2/} Volume strata is calculated using timber volume, hydric soils, and slope, and is categorized into 3 class types.
mbf = thousand board feet

old-growth stands. Ninety-nine percent (3,448 acres) of the acreage within the beach fringe occurring on the project area is classified as productive old growth (POG), and comprises approximately 15 percent of the 22,721 total POG acres within the project area (Tables 3-3 and 3-4).

The protected beach and estuary fringe buffer provides habitat corridors between blocks of old-growth forest, such as large and medium old-growth reserves. This buffer reduces the possibility of genetic isolation and subsequent decline of wildlife species that depend on large tracts of old-growth forest for all or some of their life requisites. In the Couverden project area, beach and estuary fringe provides an additional 3,448 acres of POG, including 534 acres of high-volume POG (Table 3-4). Within this high-volume category, a total of 144 acres of coarse canopy structure (volume

Table 3-4

Volstrata POG Acres and Acres of Coarse Canopy Old-growth Habitat within Beach and Estuary Fringe within the Couverden Project Area

VCU	High ^{1/}	Medium	Low	Non-Productive	Total Acres POG	Percent Total Acres of Beach Fringe by VCU	Percent Total Acres of Privately Owned POG within Beach Fringe	Total Acres of Coarse Canopy Old Growth within Beach Fringe	Percent of Coarse Canopy Old Growth in Beach Fringe	Percent of Existing Coarse Canopy Old Growth on Private Land
1170	319	1,235	729	10	2,292	66%	73%	144	4.2%	42%
1180	0	0	0	0	0	0		0	0	0
1190	0	0	0	0	0	0		0	0	0
1200	215	603	347	26	1,192	34%	20%	0	0	0
Total Acres^{2/}	534	1,838	1076	36	3,484	100%	56%	144	4.2%	42%

1/ Volume class 6 and 7 are used to identify coarse canopy old-growth attributes. No class 7 exists within the project area.

2/ Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

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class 6) exists and provides important habitat for many old-growth dependent species.

Fifty-six percent of the beach fringe is privately owned (Table 3-4). A total of 1,912 acres of non-National Forest System (NFS) land occur within the beach fringe area. Much of this area includes many of the islands south of the primary harvest area. Eight privately owned parcels are within the immediate area of harvest that include the beach buffer. Most of the non-National Forest System beach fringe in the project area is state park land. No timber harvest would occur on these lands. The smaller parcels are generally associated with cabins and there is no indication that the timber on these parcels would be harvested.

While individual trees or groups of trees may have been removed from the Couverden area beach buffer during the past 100 years, this logging does not appear to have impacted the landscape at a scale that would compromise the integrity of the existing fringe. A portion (approximately 25 acres) of the beach fringe was cleared for the only log transfer facility (LTF) within the project area in 1979 and has been used during subsequent harvest activities.

Wetlands

Wetland systems are discussed in the *Wetlands* section and described in detail in the Wetlands Resource Report (Foster Wheeler Environmental 2003b). The palustrine wetland system is divided into three classes: 1) forested, 2) scrub-shrub, and 3) emergent. In the project area, wetland classes are typically mixed. Large areas are classified as mixed palustrine emergent/palustrine forest, mixed palustrine emergent/palustrine scrub-shrub, and mixed palustrine forest/palustrine emergent. Palustrine scrub-shrub and palustrine emergent wetlands typically have the greatest value as habitat for wetland-associated species. In Southeast Alaska, palustrine emergent wetlands that have a groundcover high in sphagnum mosses and/or sedges are called “muskegs” (USDA Forest Service 1997a). These wetland types can contain a variety of plant communities, the water table is at or near the surface, and numerous small ponds are scattered throughout. Furbearers, certain waterfowl, and numerous other wildlife species tend to concentrate in wetland habitats.

Based on National Wetlands Inventory (NWI) maps, approximately 13,749 acres (28 percent) of the project area is classified as wetland (11 percent of the project area is considered forested wetland, 9 percent is classified as forested emergent complex wetland, and emergent-muskeg and scrub shrub-emergent complex makes up the remaining 8 percent) (Foster Wheeler Environmental 2003b).

Riparian Areas

Riparian resources are discussed in the *Watershed and Fisheries* section and described in detail in the Watershed and Fisheries Resource Report (Foster Wheeler Environmental 2003c). Riparian areas encompass the zone of interaction between the aquatic and terrestrial ecosystems and include streamsides, lakes, and floodplains with distinctive resource values and characteristics (USDA Forest Service 1997b). Riparian areas often contain both hardwood and coniferous forest types and, therefore, generally support a relatively high diversity of wildlife species. Riparian areas also

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provide important linkages to other habitat areas within a watershed and may act as travel corridors for certain wildlife. Fish make up a significant portion of the diet of many animal species in Southeast Alaska. Anadromous fish are primary forage for many species of birds and mammals. A reported 36 animal species depend on anadromous fish (USDA Forest Service 1997a). Species such as the black bear, brown bear, and bald eagle, depend heavily on salmon.

The acreage of riparian habitats is considered to be equal to the area of Riparian Management Area (RMA), as delineated by the stream channel process group direction (USDA Forest Service 1997b). Within the project area, high- and medium-volume old-growth forests are the predominant cover types in riparian areas. Delineated fish-bearing streams within the project area (i.e., Classes I and II) total 77.1 miles. Fish-bearing waters totaling 24.0, 18.4, 20.3, and 14.4 miles are found in VCUs 1170, 1180, 1190, and 1200, respectively. The project area includes approximately 2,838 acres in protected RMAs. Additional windfirm buffers would be implemented at the time of unit layout where needed.

Other Habitat Types

Other wildlife habitats in the project area include rockland (331 acres), brush/alder (5,624 acres), grassland (85 acres), muskeg meadow (255 acres), and recurrent slide zones (29 acres) (Table 3-3). Alpine/sub-alpine roughly corresponds to the zone near or above tree line, generally about 2,000 feet. This habitat type includes areas identified in the GIS database as low-productivity forest due to high elevation as well as high-elevation non-forest types. Approximately 8,815 acres alpine/sub-alpine are within the project area. This zone is important summer range for deer and bear; it provides resting, brooding and molting habitat for geese; and some of this habitat type may provide potential nesting habitat for the Kittlitz's murrelet, which is associated with unvegetated scree fields, barren ground, rock ledges, and talus above timberline in coastal mountains. Recurrent slide zones are important spring and summer habitats for bear.

Direct and Indirect Effects on Habitat Types

No timber harvest or new road building would occur within the beach and estuary fringe on NFS land under any of the alternatives based on Forest Plan Standards and Guidelines. Because no reasonable foreseeable activities are expected to occur on non-NFS land, discussion of effects were analyzed only on National Forest System lands.

The existing LTF would be used to barge the logs from the site and no additional LTFs are proposed for construction. No additional direct or indirect effects are likely under any of the alternatives.

Harvest activities would directly affect forested wetland sites. Alternatives 4 would affect the most area (81 acres), followed by Alternative 3 (77 acres), Alternative 2 (71 acres), and Alternative 5 (44 acres). Alternative 6 includes the least harvest and, consequently, would affect the least area of wetland acres (12 acres).

The most important direct effect on wetlands in the project area would be fill associated with road construction. Although the Couverden Timber Sale is designed to primarily use the existing roads built to support past timber harvest activities, there are up to five new classified roads proposed for unit access in the alternatives. Alternatives 2 and 3 include classified road

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construction through a wetland near Unit S-39 that would affect nearly 0.25 acre of wetland. Temporary road construction would also affect approximately 5 acres of forested wetland and 1 acre of scrub-shrub wetland under Alternatives 2 and 3. The other alternatives would not include classified road construction through wetlands, but Alternative 4 would include temporary road construction on approximately 9 acres of forested wetland and 2 acres of scrub-shrub wetland. Alternative 6 would include temporary road construction on less than 0.5 acre of forested wetland. Alternative 5 would not include road construction. Although Best Management Practices (BMPs) would be followed to maintain wetland hydrology and minimize effects to the wetland functions, loss of habitat along the road right-of-way may cause short-term effect to wildlife movement through the area. All temporary roads would be closed. Closing these roads would include removing culverts; restoring natural drainages, water bars, and revegetation; and using available natural materials to close the entrance to the road.

Timber harvest may indirectly affect adjacent or nearby wetland sites through changes in area hydrology or increased sedimentation from upslope harvest activities and potential reduction of canopy closure. These disturbances could decrease water quality downstream as well as change the vegetation composition in the short term. Loss of habitat from harvest and road construction in forested wetlands may create an avenue for increased predation and habitat fragmentation to old-growth forest dependent species. Selection harvest in forested wetland types would likely reduce short-term harvest-related effects to wetland sites. Retaining trees would mean less loss of transpiration and, hence, reduced effects on wetland hydrology (Foster Wheeler Environmental 2003b). Remaining trees also provide more canopy closure, maintaining important habitat attributes for many wildlife species that depend on wetland for all or part of their life requisites. Alternatives 2 through 4 would selectively harvest 5, 11, and 6 acres of wetland, respectively. All 44 acres of wetland harvested under Alternative 5 would be selectively harvested, while all wetland acres harvested under Alternative 6 would be clearcut with reserves.

With the exception of trees cut during road construction activities associated with the action alternatives, no timber harvest would occur in the RMAs, as per Forest Plan Riparian Standards and Guidelines. Under all action alternatives, there is a high level of riparian protection through mandatory and site-specific design considerations. Riparian habitat and function would be maintained because of these management prescribed buffers and, therefore, no direct effects are anticipated. Although the exact width of windfirm buffers are determined in the field, a GIS analysis was conducted based on various stream characteristics, such as slope, stream type, stream channel, and process group, in an effort to estimate additional acreage that would need to be applied to harvest units by alternative. Estimated additional windfirm buffering ranges from 26 acres to 128 acres (depending on the alternative) that would be added to protect RMAs. Alternative 2 could add 128 acres, with Alternatives 3, 4, and 5, and 6 adding 103 acres, 82 acres, 28 acres, and 26 acres, respectively.

No direct or indirect effects are anticipated in any of the areas that are delineated as non-forest within the project area.

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Biodiversity and Old-growth Forest

Biological Diversity

National Forest Management Act (NFMA) regulations define diversity as the distribution and abundance of different plant and animal communities and species (36 CFR 219). Biological diversity includes not only the distribution and abundance of individual organisms, but their genetic composition, and the complex pathways that link them to one another, to their environment, and the processes that sustain the whole system in which they live (Franklin 1993). Biodiversity can be evaluated at various scales, ranging from genetic and species diversity to landscape diversity.

In managing forest ecosystems, biodiversity is evaluated at the larger landscape scale. The underlying assumption is that protecting large, interconnected blocks of habitat will conserve species associated with them. In such a system, habitat must be well distributed over large geographic areas, interconnected, and capable of meeting a species' life requisites (daily, seasonal, and annual needs) (Morrison et al. 1992). This approach to species conservation was incorporated into the 1997 Revised Forest Plan, which maintains a forest-wide system of Old-growth Habitat Reserves that is intended to preserve the integrity of the old-growth ecosystem on the Tongass National Forest. This is accomplished through project-level analyses to be conducted at the landscape scale to identify blocks of contiguous old-growth forest within already identified large and medium reserves and other natural setting land use designations (LUDs) and then determine whether forest connectivity exists.

Biogeographic Province and Project Area Old Growth

Currently, the Tongass National Forest is divided into 21 biogeographical provinces. Nowacki et al. (2001), however, have recently subdivided the ecosystems of Southeast Alaska and adjoining areas of Canada into a hierarchical system of 85 ecological subsections, 73 of which cover the Tongass National Forest. The Couverden project area is classified within the Lynn Canal Biogeographic Province that encompasses approximately 634,759 acres of NFS land. Nowacki et al. (2001) have identified this area as being within the Glacier Bay Fjordlands ecological section and the Chilkat Peninsula Carbonates ecological subsection. The topography in this province is typically rugged and glaciated. The steep and angular topography can produce heavy sediment bedloads. The area is also comprised of a matrix of sedimentary rock (sandstones) with numerous bands of carbonates (Nowacki et al. 2001). The area contains ice fields, glaciers, and permanent snowfields. Western and mountain hemlock and Sitka spruce plant associations dominate the area.

Of the 634,759 acres within the Lynn Canal biogeographic province, an estimated 154,527 acres is productive old-growth (POG) forest, with 62,844 acres classified as high-volume old-growth forest (USDA Forest Service 2003). Timber harvests concentrated near the southern end of the peninsula have affected approximately 3 percent of the original POG forests within the Lynn Canal Biogeographic Province (USDA Forest Service 2003). In comparison, the Chilkat Peninsula Carbonates ecological subsection is smaller than the Lynn Canal biogeographic province area with an estimated 78,396 acres of total POG. Using this ecological breakdown, a total of 6 percent of the original POG has been harvested from this area. (Nowacki et al. 2001, USDA Forest Service 2003).

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Several management indicator species (MIS) and TES species of the Tongass National Forest attain their highest population densities in contiguous high-volume old-growth forest. Species such as Sitka black-tailed deer, marten, and goshawk are most abundant in low-elevation, old-growth forest. Although site-specific information is sparse for Southeast Alaska, current literature suggests that to maintain population viability within an area or biogeographic region, the integrity of species-rich areas such as low-elevation (Harris 1984) and high-volume old-growth forest must be emphasized (Suring et al. 1992a). The importance of low-elevation, high-volume old growth has been emphasized through the HCP Strategy and under the current Forest Plan; 88 percent of the remaining old growth is protected from harvest.

Old-growth Forest

Old-growth forests are ecosystems distinguished by old and large trees and related structural attributes (USDA Forest Service 1997a). Old growth encompasses the later stages of stand development, which typically differ from earlier stages in a variety of ways, including larger tree sizes and more variation in size and spacing, large dead standing or fallen trees, broken or deformed tops and bole and root decay, multiple canopy layers, and canopy gaps and understory patchiness (USDA Forest Service 1997a). Most of the commercial forestland in the project area is old-growth forest. Old-growth forests are important sources of valuable forest products, and they also have aesthetic and cultural values. Old-growth forests provide important nesting, foraging, rearing, denning, and cover habitat for old-growth forest associated wildlife species, including Sitka black-tailed deer, American marten, black and brown bears, goshawk, and cavity or snag-dependent species such as flying squirrels, woodpeckers, and owls. Large dead or defective trees provide nesting sites for owls and bald eagles, as well as foraging sites for woodpeckers, sapsuckers, brown creepers, and other species.

In general, old-growth forests can be divided into productive and unproductive types, based on the ability of specific areas to grow trees of a certain size (USDA Forest Service 1997a). Productive old growth is divided into three different volume strata: high, medium, and low. The volume strata delineations are based on a combination of the hydric soil, volume class, slope, and GIS coverages (Caouette and DeGayner 2004). A brief description of these different classes and their value as wildlife habitat are described below.

High-volume, Old-growth Forest

These forests have average timber volumes of 35 mbf per acre and higher (USDA Forest Service 1997a). The average height of co-dominant trees is greater than 100 feet. Canopy closure is 65 to 95 percent, with western hemlock and/or Sitka spruce dominating most sites. Stands are typically uneven-aged with small gaps in the overhead canopy. Understory production is moderate, but snow interception is high, making forage (for deer) more readily available during winter. Winter thermal cover for wildlife is good. The project area has approximately 9,692 acres of high-volume old-growth forest, which is approximately 20 percent of the project land area (Table 3-5).

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Medium-volume, Old-growth Forest

These forests have average timber volumes of 25 mbf per acre (USDA Forest Service 1997a). The average height of co-dominant trees is 70 to 100 feet and canopy closure is 40 to 75 percent. Western hemlock and/or Sitka spruce are still the dominant species. The stands are uneven-aged with numerous gaps in the overhead canopy. The more open canopy results in a more abundant understory, but it is subject to burial by snow in the winter. Winter thermal cover for wildlife is moderate. The project area has approximately 7,103 acres of medium-volume, old-growth forest, which is approximately 14 percent of the project land area (Table 3-5).

Low-volume, Old-growth Forest

These forests have average timber volumes of 16 mbf per acre (USDA Forest Service 1997a). Tree height is typically less than 60 feet and canopy closure is 20 to 50 percent. Western hemlock predominates. The Couverden area has very little cedar volume. Thermal cover for wildlife is poor. The project area has approximately 5,928 acres of low-volume, old-growth forest, which is approximately 12 percent of the project land area (Table 3-5). The remaining forested area is considered non-productive forest (0 to 8 mbf/acre) and is approximately 11,589 (or 23 percent) of the project area. A total of 15,208 acres (or 31 percent) of the project area is non-forested. Together, non-productive forest and non-forested areas comprise over 54 percent of the project area. Figures 2-2 through 2-6 show high-, medium-, and low-volume habitat within the project area and proposed harvest units by alternative.

Direct and Indirect Effects on Biological Diversity and Old-growth Forest

While most species use a variety of habitats throughout the year, old-growth forest habitats have high natural biodiversity and are most affected by timber harvest activities. Changes to old-growth habitat, its distribution, patch size, connectivity, and fragmentation are, therefore, used to evaluate effects on biodiversity. Table 3-5 shows the acres of high-, medium-, and low-volume old-growth forest potentially harvested under each alternative. The alternative with the greatest effect on medium- and high-volume old-growth forest combined is Alternative 2 (850 acres), with Alternative 6 having the least effect (161 acres). These values represent approximately 5 percent and 1 percent of the combined high- and medium-volume old-growth forest within the project area, respectively. The proposed alternatives ranking from most effect to least effect on medium- and high-volume old-growth are Alternatives 2, 3, 4, 5, and 6.

A total of 803 acres of high-volume timber have been delineated within the 44 proposed units based on timber stand exam data and GIS coverages. Alternative 2 removes the most acres of this size class (519 acres), followed by Alternatives 3, 4, 6, and 5 with 345 acres, 228 acres, 94 acres, and 92 acres, respectively.

Table 3-5 also shows the amount of coarse canopy old-growth structure by volume class (values in parentheses). Volume class 6 and 7 have been identified as important habitat characteristics for such species as marten and marbled murrelets, as well as providing winter cover for Sitka black-tailed deer. No volume class 7 has been delineated within the project area, but a total of 1,847 acres of volume class 6 has been identified with 106 acres delineated within the proposed unit pool. Units HS5 and S46 have the most coarse canopy old-growth structure, totaling 47 acres and 15 acres, respectively. Units HS7 and HS26 also have 11 acres and 2 acres

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Table 3-5

Acres of Productive Old Growth by Volume Strata, throughout the Couverden Project Area, and Proposed for Harvest under Each Alternative (numbers in parentheses represent acres of coarse canopy structure^{1/})

Timber Volume Strata	Project Area Acres	Acres within Proposed Units	Acres Proposed for Harvest, by Alternative ^{2/}					
			Alternative					
			2	3	4	5	6	
High	9,692 (1,783)	803 (94)	519 (60)	345 (48)	228 (16)	92 (13)	95 (0)	
Medium	7,100 (64)	508 (12)	331 (0)	298 (0)	181 (1)	136 (0)	67 (0)	
Low	5,929 (0)	205 (0)	98 (0)	91 (0)	136 (0)	113 (0)	9 (0)	
Non-Productive Forest			30 (0)	25 (0)	21 (0)	26 (0)	1 (0)	
Total	22,721 (1,847)	1,516 (106)	978 (60)	759 (48)	566 (17)	367 (13)	172 (0)	

1/ Volume class 6 and 7 are used to identify coarse canopy old-growth attributes. No class 7 exists within the project area.

2/ Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

identified, respectively. Alternative 2 would remove 60 acres of the coarse canopy old-growth structure, followed by Alternative 3 (48 acres), Alternative 4 (17 acres), Alternative 5 (13 acres), and Alternative 6 (0 acres). Less than 3 percent of the total coarse canopy habitat identified within the project area would be removed under any of the alternatives.

Table 3-6 shows the number of acres to be harvested by prescription. Alternative 2 would have the most harvest using a prescription of clearcut with reserves. Alternative 5 would not include any clearcutting with reserves. Although most of the timber removed under Alternatives 2, 3, and 4 would consist of clearcut with reserves, some portion of the unit would be harvested by a selective harvest prescription. Of all the action alternatives, Alternative 2 would have the most effect, both in terms of total harvest area and acres of clearcut with reserves, followed by Alternatives 3, 4, 6, and 5, in that order.

Under each of the action alternatives, some changes in biodiversity would occur within and between ecosystem levels. Significant effects to biological

Table 3-6

Acres of Harvest by Prescription under Each Alternative

Silvicultural Prescription	No Action	Number of Acres by Alternative ^{1/, 2/}				
		2	3	4	5	6
Clearcut with Reserves	0	801	537	554	0	172
Selection Harvest	0	177	222	12	367	0
Total Harvest Acres	0	978	759	566	367	172

1/ Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

2/ Total harvest acres include units with small amounts of non-productive forest or non-forested areas.

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diversity on a landscape level are not expected. Habitat removal, however, would have a direct effect on forest fragmentation and connectivity by potentially reducing the effectiveness of interior habitat, as well as affecting corridors for travel and dispersal. Short-term effects may occur from helicopter activity near mountain goat areas and active bald eagle and marbled murrelet nests. Existing Standards and Guidelines should, however, reduce or eliminate adverse effects during critical breeding periods. Timber harvest may indirectly affect adjacent or nearby forested sites by increasing the risk of windthrow following harvest and the potential for predation on old-growth forest-associated species.

Forest Fragmentation

Forest fragmentation is used to describe a process in which a forest block becomes subdivided into smaller, more isolated units. Fragmentation has the potential to isolate small populations, contribute to decreased population distribution, and contribute to the increased likelihood of local extinction. Patches of old-growth forest can be characterized as having two zones: 1) a boundary zone between the forest and the adjacent habitat (referred to as “edge” forest habitat); and 2) an interior zone that is not influenced by adjacent habitat (referred to as “interior” forest habitat). Interior habitat retains moisture, temperature, and vegetation conditions that are unique to old-forest conditions. Old-growth-associated species typically thrive in interior forest habitat conditions and tend to be sensitive to the influence of the encroachment of edge habitat (i.e., “edge effects”). The “edge effect” can typically extend 100 meters or more into the forest, which is based primarily on definable differences in micro-climate (Concannon 1995). When fragmentation occurs in a forested environment, there is an increase in the amount of edge habitat and a decrease in the interior forest habitat, making patches less suitable for interior forest, old-growth-dependent species.

The forests of Southeast Alaska are strongly influenced by southeasterly storms. The hemlock-spruce forests of Southeast Alaska are particularly susceptible to blowdown because of large, top-heavy canopies and tall tree heights (Foster and Boose 1992). The level of disturbance due to wind varies in intensity depending on topography and aspect. It is, however, the most pervasive force shaping forest composition and structure (Harris and Farr 1974). Natural forest fragmentation occurs at a small-scale disturbance level across the Tongass National Forest in the form of single trees or small groupings of trees being blown down, creating small openings in forested stands. Wind can also affect several hundred acres in violent localized storms. Nowacki and Kramer (1998) modeled wind disturbance regimes and found that exposed landscapes, where recurrent, large-scale wind events prevailed, were less likely to provide old-growth conditions over the long term than wind-protected areas. Although the absolute age when forests become old growth differs with site and forest type, Kramer (1997) concluded that catastrophic storm intervals of approximately 350 years are long enough to allow a forest to achieve old-growth conditions.

The Tongass National Forest is characterized by fragmentation on many scales. This fragmentation is the result of different processes. On a small scale, single-tree gaps within a 400-year-old Sitka spruce stand provide habitat for forest interior birds such as the hairy woodpecker. On a broader scale, large patches of wind disturbance of 10 acres or more create nesting

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habitat for songbirds such as the orange-crowned warbler. From a regional perspective, the Tongass National Forest is highly fragmented due to numerous islands and dramatic topographic relief. At a landscape level across the project area, the natural distribution of productive old-growth forest is quite patchy and is linear in many areas, with fragmentation created by muskeg, forested wetlands, and alpine areas.

Timber harvest operations, including road-building, add to the level of fragmentation or edge that occurs naturally. The effect of timber-harvest varies with the placement of units and their proximity to large existing forest blocks. Simulation studies have indicated that when 50 percent of a watershed is harvested with a staggered setting design, little if any interior forest remains. Whether a particular patch pattern and degree of fragmentation is beneficial or deleterious depends largely on the characteristics of the species using the landscape (Morrison et al. 1992). For example, the Forest Plan states that habitat for red squirrel is optimal when patch size is greater than 30 acres, but habitat for hairy woodpeckers is optimal when patch size is greater than 500 acres (USDA Forest Service 1997a).

Within the project area, approximately 9,692 acres of high-volume old-growth forest, 7,103 acres are medium-volume old-growth forest and 5,928 acres are low-volume old-growth forest (Table 3-3). Non-productive forest and non-forested areas within the project area comprise over 54 percent of the project area, which indicates a high level of natural fragmentation.

A patch size analysis was conducted to assess the degree of fragmentation of POG forest at the project area level. A total of 53 medium- and high-volume POG forested patches exist. Patch sizes range from 0.1 acre to 13,883 acres with 37 patches, or 70 percent of the patches ranging between 1 acre and 50 acres. There are 13 patches between 50 acres and 250 acres and 2 patches between 250 acres and 1,000 acres. The remaining 1 patch is 13,883 acres (Table 3-7). An analysis including low-volume POG forested patches was also conducted; however, this did not affect the outcome in terms of the proportion of the landscape within the patch size categories. Including low-volume on POG patches increased the size of the largest patch (20,000 acres) and reduced the number of total patches (38). For the purpose of discussion, only the analysis involving medium- and high-volume old-growth will be considered because relatively little low-volume old-growth would be harvested and medium- and high-volume old-growth habitat is more important to the key wildlife species being analyzed.

Table 3-7
Patch Size Analysis for All Medium- and High-volume Old-growth Combined within the Couverden Project Area

Timber Volume Strata	Number of Patches, by Patch Size ^{1/}						Total Number Patches
	1 to 15 Acres	15.1 to 50 Acres	50.1 to 100 Acres	100.1 to 250 Acres	250.1 to 1,000 Acres	>1,000 Acres	
Medium and High	14	23	9	4	2	1	53

^{1/} Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

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Direct and Indirect Effects on Forest Fragmentation

An analysis of forest fragmentation in the project area was based on the total number of medium- and high-volume old-growth forest patches and the change in the number of interior forest habitat by alternative. Patch sizes from Table 3-7 were used to estimate the acreage size of contiguous patches of medium- and high-volume old-growth within the project area. All medium-, high-, and very high-volume patches were buffered with 100-meter arcs to remove the “edge” effect. The area more than 100 meters or 330 feet from an edge was measured to determine the amount of interior forest. Table 3-8 shows the change in the number of acres of interior forest under each of the proposed alternatives, and the percent decrease.

Alternative 2 would remove an estimated 838 acres (or 11.8 percent) of the existing interior forest patches, followed by Alternative 3 (8.4 percent), Alternative 4 (5.0 percent), Alternative 5 (4.1 percent), and Alternative 6 (2.3 percent) (Table 3-8). Increase in forest edge adjacent to old growth would result in more suitable habitat conditions for species associated with forest edge (e.g., crows, jays, ravens, and great horned owls). This could result in higher levels of edge-related predation and reductions in nesting productivity for species that are particularly vulnerable to nest-site predation (e.g., marbled murrelets) (see *Additional Species of Concern* Section). Conversely, some of these potential predators (e.g., jays and crows) are important prey species for goshawks.

Table 3-8
Total Acres of Interior Forest Existing in the Project Area and by Alternative

	Existing Condition	Alternative ^{1/}				
		2	3	4	5	6
Total Acres of Interior Forest	7,109	6,271	6,514	6,754	6,819	6,944
Decrease in Number of Acres	—	838	595	355	290	165
Percent Decrease	—	11.8%	8.4%	5.0%	4.1%	2.3%

^{1/} Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

An increased level of edge effect from fragmentation would occur under all alternatives. The number of patches of medium- and high-volume old-growth forest between 1- to 15-acre and 100.1- to 250-acre patch size classes would increase (Table 3-9). The increase in the overall number of patches by alternative range from 5.4 percent under Alternatives 5 and 6 to 15.9 percent under Alternative 2. Alternative 2 would result in a 10.4 percent reduction in the size of the largest patch of medium- and high-volume old-growth forest, followed by smaller decreases under Alternatives 3, 4, 6, and 5, in that order (Table 3-9).

Another potential source of indirect effects to biodiversity related to timber harvest is road building, which may affect populations of some wildlife species. Potential effects of roads on particular wildlife species are discussed in the Wildlife Species portion of this section.

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Table 3-9
Patch Size Analysis for All Medium- and High-volume Old-growth Combined within the Couverden Project Area, by Alternative

Number of Patches by Size Class in Acres	Existing Condition	Alternative ^{1/, 2/}				
		2	3	4	5	6
1 to 15 (% increase from existing)	14	20 (30.0%)	20 (30.0%)	19 (26.3%)	17 (17.6%)	15 (6.7%)
15.1 to 50 (% increase from existing)	23	26 (11.5%)	25 (8.0%)	24 (4.2%)	23 (0.0%)	23 (0.0%)
50.1 to 100 (% increase from existing)	9	8 (-12.5%)	8 (-12.5%)	8 (-12.5%)	9 (0.0%)	9 (0.0%)
100.1 to 250 (% increase from existing)	4	6 (33.3%)	6 (33.3%)	6 (33.3%)	4 (0.0%)	6 (33.3%)
250.1 to 1,000 (% increase from existing)	2	2 (0.0%)	2 (0.0%)	2 (0.0%)	2 (0.0%)	2 (0.0%)
>1,000 (% increase from existing)	1	1 (0.0%)	1 (0.0%)	1 (0.0%)	1 (0.0%)	1 (0.0%)
Total No. of Patches	53	63	62	60	56	56
% Inc. in # Patches	N/A	15.9%	14.5%	11.7%	5.4%	5.4%
Acres of Largest Patch	13,883	12,578	12,795	13,073	13,654	13,328
% Dec. in Patch Size of the Largest Patch	N/A	-10.4%	-8.5%	-6.2%	-1.7%	-4.2%

1/ Increase in patch number for smaller patch size classes does not result in a decrease in patch number for larger size classes if the size of the remaining larger patch is still within the same size class (e.g., >1,000 acres).

2/ Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

Viable Populations and Old-growth Habitat Reserves

A system of large, medium, and small Old-Growth Habitat Reserves (OGRs) has been identified and mapped in the revised Forest Plan as part of a forest-wide, old-growth habitat reserve strategy. To maintain the integrity of the old-growth ecosystem on the Tongass National Forest, project-level analyses are conducted at the landscape scale to identify blocks of contiguous old-growth forest within already identified large and medium reserves and other natural setting LUDs. Connectivity among these blocks is evaluated during this analysis.

The NFMA regulations require that fish and wildlife habitats be managed to maintain viable populations of species well distributed across the Tongass National Forest. A viable population is defined as one having “the estimated numbers and distribution of reproductive individuals to ensure its continued existence” well distributed in the planning area (36 CFR 219.19).

Wildlife viability analyses are rarely appropriate at the project level because most species move across the landscape on a daily or seasonal basis. During the development of the Forest Plan Final EIS, a conservation strategy was designed to ensure that implementation of the Forest Plan would provide reasonable assurance of maintaining viable and well-distributed wildlife populations across the Tongass National Forest for 100 years. Project areas, because of their relatively small size, are not expected to independently maintain viable populations. Management

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activities in these areas do, however, need to consider the project-level contributions to the Forest-wide strategy.

The conservation strategy has two parts: a Forest-wide system of OGRs and a matrix management strategy. The reserve system, which is designed to maintain the integrity of the old-growth forest, includes three major elements: 1) non-development LUDs that maintain old-growth integrity, 2) full protection of islands less than 1,000 acres, and 3) small (approximately 1,600 acre), medium (10,000+acres), and large (40,000+ acre) OGRs (USDA Forest Service 1998, Appendix K of USDA Forest Service 1997b). This reserve system totals approximately 1.1 million acres (USDA Forest Service 1997b, Record of Decision [ROD] pg. 7) and has been adjusted by 17 non-significant amendments. The second component of the conservation strategy concerns the management of matrix lands, which comprise 22 percent of the Tongass. Matrix lands include LUDs where timber harvest is permitted. Standards and guidelines under the conservation strategy focus on maintaining components of the old-growth ecosystem within matrix lands indicated to be important for wildlife and maintaining connectivity between old-growth forest habitat (USDA Forest Service 1997a). Management prescriptions include establishing 1,000-foot estuary and beach fringe no harvest zones, buffers protecting old-growth riparian habitat, and limiting harvest in other sensitive areas (e.g., steep slopes, visible travel routes, high hazard soils) and where harvest is not logistically feasible. Matrix lands are important for maintaining biodiversity and sustaining wildlife population viability because they serve as travel corridors and temporary functional habitat between old-growth reserves.

Small OGRs require a contiguous landscape of at least 16 percent of the total VCU area and 50 percent of this area must be productive old-growth timber (USDA Forest Service 1997b). Along with the general criteria of size, productive old-growth timber, and connectivity, the design of each reserve should also be based on the wildlife concerns specific to the area. Criteria that are commonly used in designing small reserves include important deer winter range, probable goshawk nesting habitat, probable marbled murrelet nesting habitat, large forest blocks, rare plant associations, and landscape linkages (Forest Plan 1997). Small OGR boundaries may be adjusted during project planning. Where feasible, the boundaries should follow geographic features so that the boundaries can be recognized in the field.

An interagency review by biologists from the Forest Service, Alaska Department of Fish and Game (ADF&G), and U.S. Fish and Wildlife Service (USFWS) determined that the mapped small OGR in VCU 1180 did not meet the requirements for size and it did not optimize deer winter habitat. The review team recommended that the boundary be adjusted to extend further up the east side of Swanson Creek along the 800-foot contour. The adjusted boundary would be 300 feet from all classified roads to reduce disturbance and exclude all second-growth managed stands. The additional forested acreage would include high volume old-growth stands that provide high-value deer, marten, marbled murrelet, and goshawk habitat. Due to the amount of acres in productive old growth non-development LUD (e.g., semi-remote recreational) and a medium OGR in VCUs 1190 and 1200, no additional small OGRs are needed.

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The modified OGR in VCU 1180 would be 2,258 acres, compared to 1,469 acres identified in the Forest Plan. The modified OGR would be 16.4 percent of the total acreage in VCU 1180 (Table 3-10). This would include 1,874 acres of low, medium, and high volume old-growth timber in the reserve, which is 72 percent of the acres in the OGR. The recommended OGR is rather linear. Options for a more circular configuration were limited due to previous harvest in the area and old-growth distribution in the watershed.

Table 3-10
Small Old-growth Reserve Analysis within the Couverden Project Area

VCU	Total VCU Acres	16% of VCU Acres	Modified or Existing OGR Acres	Difference	POG Acres Required	Actual POG Acres
1180	13,733	2,197	2,258	+ 61 Acres	1,099	1874
1170	11,159	1,785	1,328	- 457 Acres	893	^{1/}

1/ The small OGR in VCU 1170 would be revised if timber harvest is proposed in this VCU in the future.

Note: Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

No changes were recommended for the small OGR in VCU 1170, because no timber harvest or road construction is proposed in this VCU.

Direct and Indirect Effects on OGRs

All action alternatives include changing the small OGR boundaries as recommended by the interagency team. No direct or indirect effects on wildlife viability or OGRs are anticipated, other than the positive effect of adjusting the boundary of the existing small OGR.

Wildlife Corridors and Habitat Connectivity

Low-elevation passes, beach and estuary fringe, and stream corridors provide natural connections between forested blocks and are important areas for migrating and dispersing wildlife. Corridors can be protected by restricting harvest within them or by managing the matrix of habitat between the reserves (Suring et al. 1992a). Maintaining forested corridors between old-growth habitat reserves is a key component to maintaining viable wildlife populations on the Forest because most of the habitat matrix between the reserves is scheduled for harvest (USDA Forest Service 1997b).

Maintaining effective wildlife corridors between the small OGRs, the adjacent roadless area, and the 10,552-acre medium OGR located near Excursion Inlet is the principal connectivity issue for the project. Travel corridors were identified during fieldwork in and near Units HS5, HS7, HS8, H25, and H32. Wildlife movements within the Couverden project area are discussed in detail in the Wildlife Resource Report.

From a landscape perspective, OGRs provide some connectivity or linkages to other reserves or other protected LUDs outside the project area. (See the *Viable Populations and Old-growth Habitat Reserve* section.) Within the project area, corridors that link alpine areas to the beach fringe are important due to past harvest activities. Connectivity does not necessarily mean that old-growth areas have to be physically joined in space, as many associated animal species can move across areas that are not in old-growth ecosystem conditions. Landscape features affecting connectivity of OGR ecosystems are distances between old-growth areas and forest conditions in the areas between the old-growth areas (USDA Forest Service 1997b).

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Direct and Indirect Effects on Wildlife Corridors and Habitat Connectivity

Harvesting in units HS5, HS7, HS8, H25, and H32 may directly affect use of these areas as travel corridors for moose, deer, bear, and marten. The northwest boundary of Unit H25 was modified to maintain this important travel corridor. Other travel corridors may be present within the project area, however, use of these above five units was documented in the field harvest. Alternatives 2, 3, and 5 incorporate single tree and group selection harvest for Units HS5 and HS7. Unit HS8 would be clearcut with reserves under Alternative 2 and a portion of the unit (16 acres within 500 feet of the existing road) would have single tree and group selection harvest under Alternative 5. Units H25 and H32 would be clearcut with reserves under Alternatives 2, 3, and 4, and the area within 500 feet of the existing road would have single tree and group selection harvest under Alternative 5. Alternative 6 would implement clearcut with reserves in H32, but it would not harvest the other four units.

These units were evaluated based on a combination of their size, position on the landscape, and, to a lesser extent, the harvest prescription in order to assess impacts to the documented wildlife corridors from the proposed alternatives. Based on these criteria, Alternative 2 would have the greatest effect on the corridors, followed by Alternatives 3, 5, 4, and 6, in descending order.

Implementation of the project could temporarily displace wildlife during road construction and actual timber harvest. The proposed timber sale has the potential to limit wildlife movements through portions of the project area.

Important brown bear foraging sites extend along the lower portions of Homeshore Creek and the Swanson Creek. These areas will continue to function as travel ways. Forest Plan Standards and Guidelines for riparian and beach/estuary buffers will also protect corridors throughout the project area. It should be noted that four units within the Homeshore drainage (HS1, HS2, HS3, and HS4) were removed from the initial unit pool. Each of these units contained well used wildlife trails between older harvest units, and provided a connected travel corridor from the higher elevation alpine areas of the project to the beach fringe. In addition, the removal of these units eliminated additional road construction or reconstruction that would have otherwise been required for access. No harvest would occur in this area under any alternative. In addition, implementation of any of the action alternatives would not substantially alter the Swanson Creek travel corridor, which includes the small OGR, that connects the higher elevation area of the project area to the protected beach fringe.

No direct or indirect effects on habitat connectivity between designated OGRs within and adjacent to the project area are anticipated, other than the positive effect of adjusting the boundary of an existing small old-growth habitat reserve within VCU 1180 further up Swanson Creek drainage. This adjustment would exclude an existing road from the OGR and increase the number of acres of old-growth maintained in this OGR.

Wildlife

The Tongass National Forest provides habitat for 54 species of mammals, 231 species of birds, and 5 species of amphibians and reptiles. An additional 18 species of marine mammals found in Southeast Alaska depend entirely on the ocean environment, as well as 45 bird and 3

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amphibian or reptile species considered casual or accidental visitors to Southeast Alaska. These species provide many opportunities for consumptive and non-consumptive uses, including commercial, sport, and subsistence hunting, and photographic and viewing activities (USDA Forest Service 1997a).

ADF&G collects most terrestrial harvest information in terms of State-defined major and minor units. In many cases these are identical to VCUs. For the Couverden project area, VCU 1200 is the same as Minor 0601 and VCU 1190 is the same as Minor 0602. VCU 1180 contains most of Minor 0507 and a small portion of Minor 0504. VCU 1170 contains most of Minor 0504 and a small portion of Minor 0507. No timber harvest units are proposed within the small part of VCU 1170 that is within the project area.

This section addresses the wildlife species within the project area, including Forest Service management indicator species (MIS), USFWS species of concern (SOCs), and other species of interest (SOIs), such as waterfowl and wading birds (Table 3-11).

Management Indicator Species

The National Forest Management Act of 1976 mandates that “fish and wildlife habitat shall be managed to maintain viable populations of existing native vertebrate species.” The regulations under National Forest Management Act specify certain species to be selected as MIS and indicate that these species must be identified in all forest planning processes.

MIS are species whose response to land management activities can be used to predict the likely response of other species with similar habitat requirements. The spruce and hemlock forests represent 98 percent of the productive old-growth forests of the Tongass. Although some of the 13 MIS are associated with several habitat types, all are associated with the spruce/hemlock forest types. The relative importance of conifer successional stages as habitat for the MIS is discussed in greater detail in the Forest Plan. Productive old-growth forests provide essentially all of the highly important habitats and the preponderance of the moderately important habitats for all the MIS.

All 13 of the MIS identified in the 1997 Revised Forest Plan are addressed below, except for the Vancouver Canada goose and Alexander Archipelago wolf, which are addressed in the *Other Species of Concern* section. All of the MIS were documented within the project area except the brown creeper.

Bald Eagle (*Haliaeetus leucocephalus*)

The bald eagle is an MIS species. Over 90 percent of the known nests on the Tongass National Forest are within 500 feet of the saltwater beach. USFWS and the Forest Service maintain an interagency agreement for bald eagle habitat management in the Alaska Region and periodically update their GIS coverage for bald eagles. Currently, there are 135 known bald eagle nests within the Couverden project area. Approximately 45 documented nests occur within the vicinity of the area where harvest is proposed. The remainder of the nests are along the shoreline of the islands on the south tip of the project area. All are within the estuaries or along the shoreline. A 330-foot radius protective management zone surrounds all identified nest trees.

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Table 3-11
Species of Concern that May Occur on the Tongass National Forest

	Species	Status ^{1/}	Observed
Amphibians			
spotted frog	(<i>Rana pretiosa</i>)	SOC	No
Birds			
Peale's peregrine falcon	(<i>Falco peregrinus pealei</i>)	FS Sensitive	No
osprey	(<i>Pandion haliaetus carolinensis</i>)	FS Sensitive	No
Queen Charlotte (northern) goshawk	(<i>Accipiter gentilis laingi</i>)	FS Sensitive	No
trumpeter swan	(<i>Cygnus buccinator</i>)	FS Sensitive	No
bald eagle	(<i>Haliaeetus leucocephalus</i>)	FS MIS	Yes
hairy woodpecker	(<i>Picoides villosus</i>)	FS MIS	Yes
red-breasted sapsucker	(<i>Sphyrapicus ruber</i>)	FS MIS	Yes
brown creeper	(<i>Certhia americana</i>)	FS MIS	No
Vancouver Canada goose	(<i>Branta canadensis fulva</i>)	FS MIS	Yes
olive-sided flycatcher	(<i>Contopus borealis</i>)	SOC	Yes
marbled murrelet	(<i>Brachyramphus marmoratus</i>)	SOC	Yes
Kittlitz's murrelet ^{2/}	(<i>Brachyramphus brevirostris</i>)	SOC	No
great blue heron	(<i>Ardea herodias</i>)	SOC	Yes
harlequin duck	(<i>Histrionicus histrionicus</i>)	SOI	Yes
Mammals			
Steller sea lion	(<i>Eumetopias jubatus</i>)	T	Yes
humpback whale	(<i>Megaptera novaeangliae</i>)	E	Yes
Alexander Archipelago wolf	(<i>Canis lupus ligoni</i>)	FS MIS	Yes
black bear	(<i>Ursus americanus</i>)	FS MIS	Yes
brown bear	(<i>Ursus arctos</i>)	FS MIS	Yes (Skeleton)
American marten	(<i>Martes americana</i>)	FS MIS	No
Sitka black-tailed deer	(<i>Odocoileus hemionus sitkensis</i>)	FS MIS	Yes
Mountain goat	(<i>Oreamnos americanus</i>)	FS MIS	Yes
red squirrel	(<i>Tamiasciurus hudsonicus</i>)	FS MIS	Yes
river otter	(<i>Lutra canadensis</i>)	FS MIS	Yes
moose	(<i>Alces alces</i>)	SOI	Yes

1/ FS Sensitive=Forest Service sensitive species, FS MIS=Forest Service Management Indicator Species, SOC=Federal Species of Concern, T=Federally listed as Threatened, E=Federally listed as Endangered, SOI=Species of local Interest.

2/ On April 13, 2004, the USFWS named Kittlitz's murrelet as a candidate for protection under the Endangered Species Act (ESA).

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Direct and Indirect Effects on Bald Eagles

No direct or indirect effects are anticipated for bald eagles. The Bald Eagle and Riparian Forest-wide Standards and Guidelines are specifically designed to protect nesting habitat. The Forest Plan has standards and guidelines for managing 1,000-foot buffers around estuary and beach fringe habitats. No nest sites were observed during the 2002 field season. If nests are discovered during harvest, they would be protected by a 330-foot radius management zone. Also, if a nest is found during implementation, disturbance could occur from helicopter logging or transportation of crews and equipment by helicopter to various areas. Helicopter activities would, therefore, be restricted within 0.25 mile of active nests. No project-related activities are anticipated that would directly or indirectly affect the foraging, resting, and nesting habitat for bald eagles and other raptors under any of the alternatives.

Old-growth Forest Bird MIS

Although no site-specific breeding bird surveys were conducted, birds were identified and recorded during other wildlife surveys and in conjunction with unit walkthroughs, stream inventory, and mainline road locations. Three MIS for old-growth forests are known or thought to occur in the project area: hairy woodpecker (*Picoides villosus*), red-breasted sapsucker (*Sphyrapicus ruber*), and brown creeper (*Certhia americana*). Hairy woodpecker and red-breasted sapsucker were documented in or near several of the proposed units. No brown creepers were documented during the 2002 field season.

Hairy Woodpecker (*Picoides villosus*)

The hairy woodpecker is considered an uncommon permanent resident throughout Southeast Alaska. Hairy woodpeckers use old-growth forest habitats with snags and partially dead trees for foraging and nesting. Hairy woodpeckers are primary cavity excavators. They are called primary excavators because they create cavities that are used by other wildlife species in subsequent years. Their winter habitat may be the primary limiting factor (USDA Forest Service 1997a). Snag quantity has a direct relationship to the potential use of an area by hairy woodpeckers. Old-growth forests provide the best long-term snag habitat, with high-volume old-growth stands receiving more use than low-volume stands. Optimum habitat use is believed to occur when patches of preferred habitat are greater than 500 acres (USDA Forest Service 1997a).

Red-breasted Sapsucker (*Sphyrapicus ruber*)

The red-breasted sapsucker is found throughout Southeast Alaska during the spring, summer, and early fall seasons. The species winters in the coastal portion of its breeding range as far north as Prince of Wales Island. Like the hairy woodpecker, red-breasted sapsuckers use old-growth forest habitats with snags. The quantity of snags has a direct relationship to the number of red-breasted sapsuckers within an area. Old-growth forests provide the best snag habitat over the long term, with the low-volume old-growth forest classes receiving more use than high-volume classes (USDA Forest Service 1997a). Optimum habitat use is believed to occur when patches of preferred habitat are greater than 250 acres (USDA Forest Service 1997a).

Brown Creeper (*Certhia americana*)

The brown creeper is considered an uncommon, permanent resident throughout Southeast Alaska. This species is associated with large, old-growth trees found in high-volume old-growth forests. Winter habitat has been suggested as the principal limiting factor for cavity-nesting birds, including the brown creeper (USDA Forest Service 1997a). Optimum

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habitat use is believed to occur when patches of preferred habitat are greater than 15 acres. No brown creepers were recorded during the 2002 field season.

Direct and Indirect Effects on Old-growth Forest Bird MIS

Applying the Reserve Tree/Cavity-nesting Habitat Standards and Guidelines of the Forest Plan (1997b) conserves habitats for these species. Leaving reserve trees would contribute future habitat. Table 3-12 shows the amount of productive old-growth forest that would be affected under each alternative. Alternative 2 would have the greatest effect on the red-breasted sapsucker, hairy woodpecker, and brown creeper followed by Alternatives 3, 4, 5, and 6.

Table 3-12
Total Acres of Productive Old Growth and Number of Acres Proposed for Harvest by Volume Class under Each Alternative within the Project Area

Timber Volume Strata	Project Area POG	Number of Acres Harvested by Alternative ^{1/, 3/}				
		2	3	4	5	6
High ^{2/}	9,692	519	345	228	92	95
Medium	7,100	331	298	181	136	67
Low	5,929	98	91	136	113	9
Total	22,721	948	734	545	341	171

1/ Total harvest acres include units with small amounts of non-productive forest or non-forested areas.

2/ Includes high and very high volume timber.

3/ Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

Indirect effects would be associated with fragmentation and patch size reduction of suitable habitat for old-growth forest bird MIS. Patch size analysis indicated that only three patches greater than 250 acres would occur within the project area and further fragmentation would occur under all alternatives. Most of the increase in the number of patches of medium- and high-volume old-growth forest creates more patches of 1- to 15-acre and 100.1- to 250-acre patch size classes (Table 3-9). The increase in the overall number of patches by alternative range from 5.4 percent under Alternatives 5 and 6 to 15.9 percent under Alternative 2.

Black Bear (*Ursus americanus*)

Black bears are present throughout the mainland and on the islands south of Frederick Sound (USDA Forest Service 1997a). They use habitats from sea level to alpine terrain. Estuarine, riparian, and forested coastal habitats receive the highest use by black bears and appear to have the highest habitat values (USDA Forest Service 1997a). Within forested areas, both early and late (old-growth) successional stages provide good forage and/or cover for black bears. Black bears prefer anadromous fish streams to resident fish streams (USDA Forest Service 1997a). They are very mobile on land and are not known to have specific vegetation corridor requirements (USDA Forest Service 1997a). Unproductive forest, clearcuts up to 25 years old, and low- and medium-volume productive old-growth forest is considered suitable bear foraging habitat because of high berry production. Medium- and high-volume stands generally provide a greater number of den sites. Estuarine, riparian, and forested coastal habitats receive the highest use by black bears and appear to have the highest habitat values (USDA Forest

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Service 1997a). Bears appear to avoid clearcuts until forage species are well established, which, for productive sites in Southeast Alaska, occurs within 2 to 3 years following harvest (Suring et al. 1988a). Black bear hunting is known to be good within the Couverden area. The harvest numbers, however, are relatively small, with 45 percent of bears taken from Minor 0601 (VCU 1200) and 39 percent taken from Minor 0504. Visual observations, scat, and tracks were documented throughout the project area during the 2002 field season.

Direct and Indirect Effects on Black Bear

Preferred habitat for black bear includes coastal, estuarine, and riparian areas. The Forest Plan Standards and Guidelines maintain buffers with no programmed timber harvest along all of these areas. Based on habitat protection in the existing small OGR, other surrounding non-development LUDs (Semi-remote Recreation), and Forest Plan Standards and Guidelines buffers on beach fringe and streams, as well as alternatives to clearcutting and the closing of all new roads after harvest, the project is not expected to have significant effects on the black bear.

The alternative with the greatest effect on medium- and high-volume old-growth forest combined is Alternative 2 (850 acres). Alternative 6 has the least effect (162 acres). The above values represent approximately 5 percent and 1 percent of the combined high- and medium-volume old-growth forest within the project area, respectively. The proposed alternatives ranking from most effect to least effect on medium- and high-volume old-growth are Alternatives 2, 3, 4, 5, and 6.

The existing road density within the Couverden project area is 0.5 mile per square mile (not including closed unclassified roads). Increases in road densities for all action alternatives range from 0.0 to 0.2 mile per square mile depending on VCU. The overall road densities within the project area, however, would stay the same or increase by 0.1 mile per square mile. Additional road access could affect black bear populations by increasing hunter success. Alternative 2 would have the greatest effect, adding 4.3 miles of new classified road, followed by Alternative 3 (3.4 miles), Alternative 4 (1.4 miles), and Alternative 6 (0.4 miles). Alternative 5 would not add any new roads and would have the least effect. Closing the roads to motorized vehicles post harvest should, however, minimize potential impacts.

Brown Bear (*Ursus arctos*)

Records indicate that the current brown bear distribution in Southeast Alaska has not changed from historical brown bear distribution, and some of the highest brown bear population densities in the world occur in the Tongass National Forest (Schoen et al. 1989). Brown bear occurs within the project area. Skeletal remains of a brown bear, including a skull, were found near the mouth of Humpy Creek. Scat and tracks were found in the Homeshore area during the 2002 field season. Forest Service personnel evaluated whether additional protection of brown bear foraging sites (e.g., waterfalls used as fishing sites) were needed along any of the Class I streams within the project area as defined under the Tongass Plan Implementation Team clarifications (USDA Forest Service 1998) in September 2002. Important brown bear foraging sites are defined as areas adjacent to Class I anadromous fish streams within moderate gradient/mixed control and flood plain process groups where there are high densities of brown bear feeding on salmon.

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Surveyors walked lengths of Swanson and Homeshore Creeks looking for bear use. Trails, daybeds, tracks, salmon carcasses, and one sighting of a brown bear were recorded. Important brown bear foraging sites were documented and delineated along portions of Homeshore Creek adjacent to Units HS5 and HS7 and north. The lower portion of Swanson Creek (from the mouth of the creek to the falls between Unit S43 and Unit S49) also contains important brown bear foraging sites (2002 brown bear survey report can be found in the project record). A total of four brown bears have been documented to have been taken from the Couverden project area between 1981 and 2001 in Minor 0601 (i.e., VCU 1200).

Direct and Indirect Effects on Brown Bear

The proposed Couverden project is expected to have minor effects on brown bear habitat because this species uses a wide variety of habitats including clearcuts.

Important brown bear foraging sites identified by Forest Service personnel (i.e., Homeshore and Swanson Creeks) have 500-foot buffers delineated along high use areas per the 1998 Tongass Plan Implementation Team clarifications to protect these areas along the lower portions of Homeshore and Swanson creeks from potential alteration of the riparian buffer and disturbance during bear foraging activities. Although the areas near Units HS1, HS2, HS3, and HS4 are not high-use foraging habitat for brown bears, they are important travel corridors for the bears, connecting the higher elevation alpine areas to the beach fringe. No harvest would occur in this area under any alternative. Future harvest would depend on adjacent second-growth stands maturing to the point that they can provide travel routes. Units HS5 and HS7 within the Homeshore drainage are directly adjacent to an area documented as high use by brown bear and buffered to protect important bear foraging sites. Additional survey information stated that numerous trails were documented connecting this area to nearby forested stands, which suggests that bear travel is concentrated along the remaining forested areas in the lower elevations. Alternatives 2 and 3 have the greatest potential to remove medium- and high-volume old-growth within Units HS5 and HS7.

Roads and other human disturbances (e.g., facilities, camps) lead to an increase in bear-human encounters, which in turn may lead to bear population declines and reduced bear densities. Implementing any of the proposed action alternatives would increase road densities throughout the project area and would range from 0 to 0.2 mile per square mile. All new roads would be closed to motor vehicles after the project is completed. This would include 4.3 miles (Alternative 2), 3.4 miles (Alternative 3), 1.4 miles (Alternative 4), 0.4 mile (Alternative 6), depending on the selected alternative. No new roads would be built under Alternative 5. Only Alternatives 2, 3, and 5 propose harvest in Units HS5 and HS7, with no new roads built under Alternative 5. Gated roads are less detrimental to bears than are roads open to passenger vehicles, but they still result in lower habitat quality due to the potential for interactions with people hiking or using off-highway vehicles (OHVs) and mountain bikes on closed roads.

Based on habitat protection in OGRs, Forest Plan-mandated buffers on beach fringe and streams, additional stream buffers for important critical

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brown bear foraging sites, and road closures after harvest is completed, the project is not expected to have significant effects on the brown bear.

Marten (*Martes americana*)

Marten habitat use in western coniferous forests is related to canopy cover, availability of suitable resting and denning sites, and prey abundance (Buskirk et al. 1989). Optimal forest cover for marten in Southeast Alaska is generally considered to occur in older forests. This species is considered an indicator of low-elevation old-growth forests during the winter (USDA Forest Service 1997a). The quantity and quality of winter habitat is the most limiting factor for marten in Southeast Alaska. Open roads through marten habitat increase opportunities for trappers to harvest this species. High marten populations are usually associated with areas having restricted human access, such as roadless areas or areas where trapping pressure is strictly regulated. Martens are easily trapped, thus, their populations decline more drastically when road densities approach 0.6 mile per square mile (Suring et al. 1992b). The Excursion Inlet-Couwerden area was historically a productive trapping area, however, relatively little trapping activity currently takes place. From 1980 to 2001, Juneau and Hoonah communities have taken a total of 148 martens (all from Minor 0601), which is equivalent to VCU 1200 (Foster Wheeler Environmental 2003d). VCU 1200 includes most of the coastline in the project area as well as the coastal lands north of the planning area.

Marten habitat is considered to be high-volume old-growth forest below 1,500 feet in elevation. Currently, there are approximately 7,981 acres of high-probability marten habitat in the project area. Marten are expected to occur throughout the lower elevations of the project area and were documented by Forest Service personnel in 2002.

Several critical assumptions included in the Forest Plan about martens have strong support in the scientific literature or from studies of martens in Southeast Alaska. The assumption that martens select forest with old-growth features over regenerating stands and that this selection is strongest in winter is supported in the literature (USDA Forest Service 2001). Some assumptions in the Forest Plan, however, have mixed support in the scientific literature or local marten data. Partially harvested stands with 10 to 30 percent canopy cover may serve as habitat during summer and be used for dispersal, but ADF&G marten biologists believe that they would be perceived much like clearcuts and would not be used during winter or once regenerating forest shaded out shrub and forb growth (see the Tongass National Forest 2000 Monitoring and Evaluation Report for additional information).

The Forest Plan has specific protective standards and guidelines for marten habitat in high risk biogeographic provinces. The Couwerden project area does not fall into one of these provinces. A coarse filter analysis using GIS data was conducted to quantify the amount of suitable marten habitat within the project area. Suitable marten habitat was defined as high-volume forest below 1,500 feet in elevation. In addition to the coarse filter analysis, the marten habitat capability model (Suring et al. 1992b) was run in conjunction with the Sitka black-tailed deer model. Results of the marten model are shown in Table 3-13 and Figure 3-2. Table 3-14 shows the acreage of existing high-volume old-growth forest below 1,500 feet in elevation.

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Table 3-13

Number of Acres Associated with Marten Habitat Capability Model HSI Output by VCU

HSI Scores	Acres by VCU ^{1/}					Percent
	1170	1180	1190	1200	Total	
Low (0.0 to 0.29)	3,339	8,870	10,392	3,881	26,482	54%
Medium (0.30 to 0.59)	3,265	1,553	963	1,851	7,632	15%
High (0.60 to 1.00)	4,584	3,310	3,514	4,000	15,408	31%
Total Acres in VCU	11,188	13,733	14,869	9,732	49,522	

^{1/} Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

Table 3-14

Existing Acres of High-volume Productive Old-growth below 1,500 Feet Elevation, Acres of Volume Class 6^{2/}, and Acres Proposed for Harvest under Each Alternative

Elevation Class	Project Area Acres	Acres Proposed for Harvest, by Alternative ^{1/}				
		2	3	4	5	6
< 800 Feet	4,039	209	181	83	41	53
800 to 1,500 Feet	3,942	221	131	135	18	41
Total	7,981	430	312	218	59	94

Coarse Canopy Habitat (Volume Class 6)^{2/}

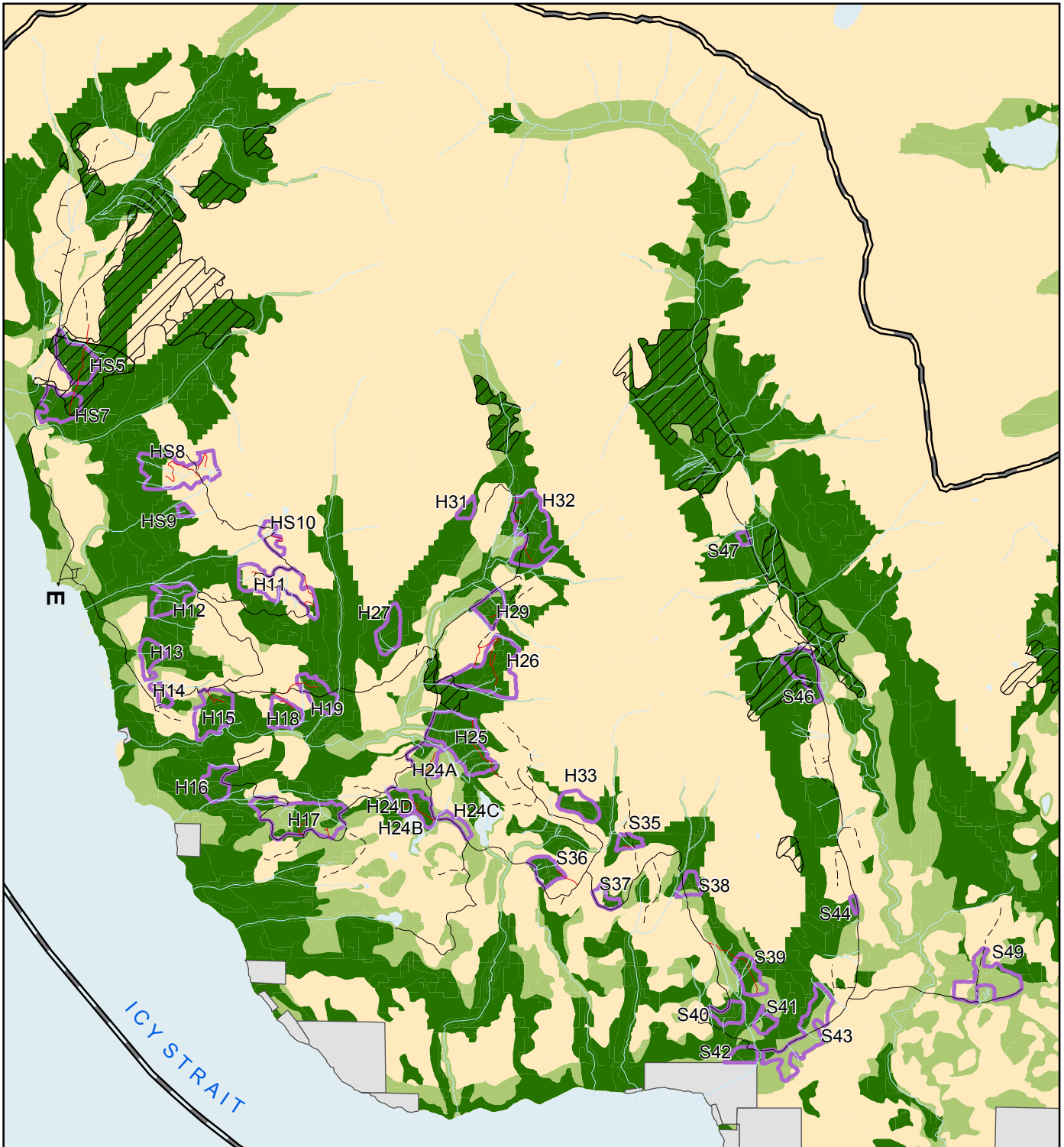
< 800 Feet	860	59	48	16	13	0
800 to 1,500 Feet	720	1	0	0	0	0
Total	1,580	60	48	16	13	0

^{1/} Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

^{2/} Volume classes 6 and 7 are used to identify coarse canopy old-growth attributes. No class 7 exists within the project area.

Approximately 7,981 acres of the 22,721 acres of the existing POG (35 percent of the project area) are considered suitable marten habitat (Table 3-14).

Habitat suitability index (HSI) values were grouped into three categories of marten habitat quality: high (HSI equal to or greater than 0.6), medium (HSI ranges from 0.3 to 0.59), and low (HSI ranges from less than 0.01 to 0.29). High- and medium-quality winter ranges primarily reflect the availability of high- and mid-volume old-growth forest and lower elevations (Figure 3-2). Based on model output, there are approximately 26,482 acres (54 percent) of low-quality marten habitat in the project area (Table 3-13). The remaining 46 percent of the Couverden area is considered to provide medium- to high-quality habitat.



Legend

- m** LTF - Log Transfer Facility
- Stream
- Proposed Road
- Existing Classified Road
- Former Temporary Road
- Project Boundary
- Unit Pool (Unit# H33)
- High Structure Habitat
- Non-NFS Land

HSI

- Low-value Habitat
- Medium-value Habitat
- High-value Habitat
- Water Body

Figure 3-2
Marten Habitat



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Direct and Indirect Effects on Marten

The alternative with the greatest effect on high-volume old-growth forest is Alternative 2 (430 acres). Alternative 5 has the least effect (59 acres, all of which would be selectively harvested). The above values represent approximately 5 percent and less than 1 percent of the high-volume old-growth forest located within the project area, respectively. The proposed alternatives ranking from greatest effect to least effect on suitable marten habitat (e.g., high-volume old-growth stands) are Alternatives 2, 3, 4, 6, and 5.

Based on the model output, the greatest impacts to medium- and high-quality marten habitat would occur in the Homeshore Creek and Humpy Creek drainages in Units HS5, HS7, H15, H16, H17, H18, H19, H25, H26, and H32. Clearcut with reserves or single tree selection and group selection would be implemented for all proposed units, as described in the alternatives. All action alternatives would reduce winter use of these areas by marten. Based on the amount of total acres proposed for harvest and amount of those acres to be clearcut with reserves, Alternative 2 would have the greatest effect on medium- to high-quality marten habitat, followed by Alternatives 3, 4, 6, and 5 (Table 3-5).

Volume class 6 and 7 were also used to assess important coarse canopy stands within the project area. Coarse canopy old-growth habitats may provide better denning habitat for marten than other medium- and high-volume forested stands. Approximately 1,580 acres of coarse canopy volume class 6 below 1,500 feet in elevation are within the project area (Table 3-14). Fifty-four percent of volume class 6 occurs in high-volume old-growth forest less than 800 feet in elevation, with the remaining acres occurring between 800 and 1,500 feet in elevation. Coarse canopy structure comprises 20 percent of the high-volume old-growth and 3 percent of the total project area.

Units HS5 and S46 have the most coarse canopy structure, 47 acres and 15 acres, respectively. Units HS7 and HS26 have 11 acres and 2 acres, respectively. Alternative 2 would remove 60 acres, followed by Alternative 3 (48 acres), Alternative 4 (16 acres), and Alternative 5 (13 acres). Alternative 6 would not remove any coarse canopy structure. Less than 4 percent of the total coarse canopy habitat identified within the project area would be removed under any of the alternatives.

Significant effects to marten habitat on a landscape level are not expected because the amount of suitable habitat proposed for timber harvest is small. Less than 9 percent of the total high-volume old-growth forest less than 1,500 feet elevation could be removed under any of the proposed alternatives.

Marten are easily trapped and are prone to over harvest, especially when trapping pressure is high. An increase in road density, particularly when located through marten travel corridors and foraging areas, would increase human access and the risk of trapping mortality. Marten populations have been shown to decline at road densities of 0.2 mile per square mile and winter habitat capability progressively decreases with increasing road density, leveling off at 0.6 mile per square mile (Suring et al. 1992b). Under all alternatives, the road density in the project area would remain at or below 0.6 mile per square mile (Suring et al. 1992b). All new roads would be

Affected Environment and Environmental Consequences 3

closed following harvest, which is designed to reduce exposure of wildlife populations to increased hunting and trapping resulting from increased road access. Roads would be closed at the first practical point, either by tank trap at the beginning of the road, at the first stream, or by official road closure orders.

River Otter (*Lutra canadensis*)

River otters are associated with coastal and fresh water aquatic environments and the immediately adjacent (within 100 to 500 feet) upland habitats (USDA Forest Service 1997a). Beach characteristics affect the availability of food, and nearby upland vegetation is also important in providing cover for otters. Old-growth forests have the highest habitat value, providing canopy cover, large-diameter trees and snags, and burrow and den sites. Younger successional stages provide lower-quality habitat. A total of 3,484 acres of beach fringe is within the project area and an additional 2,838 acres is protected under riparian standards and guidelines. Although 56 percent of the beach fringe is non-NFS land, no reasonably foreseeable activities are anticipated to occur on these lands. River otters were documented during the 2002 field season.

Direct and Indirect Effects on River Otter

No direct or indirect effects are anticipated for the river otter. The river otter's primary habitat is in old-growth stands located near the coast and larger lakes and streams in the project area. The Forest Plan Standards and Guidelines maintain buffers along shorelines and estuaries and around all Class I and II streams. Coastal areas most likely to support river otter are protected by 1,000-foot no-cut buffers; therefore, effects on river otter should be very low under all alternatives.

Red Squirrel (*Tamiasciurus hudsonicus*)

Red squirrels require forests with cone-producing trees and cavities in trees or snags. Spruce trees and mature/old-growth forests are considered to have the highest values for red squirrel habitat (USDA Forest Service 1997a). Optimum conditions are believed to occur where patches of preferred habitat are greater than 30 acres (USDA Forest Service 1997a). Red squirrels occur throughout the project area. Individual squirrels and signs of red squirrel activity (audio, middens, and foraging sites) were observed during the 2002 wildlife surveys.

Direct and Indirect Effects on Red Squirrels

Alternative 2 would remove up to 947 acres of productive old-growth forest, or 4 percent of the total POG within the project area, followed in decreasing order by Alternatives 3, 4, 5, and 6 (Table 3-12). The project is, therefore, likely to affect some red squirrel habitat, although Forest Plan Standards and Guidelines for beach fringe and riparian buffers are expected to provide old-growth habitat sufficient to maintain populations of red squirrels in the project area. Harvest prescriptions that leave trees, especially selectively harvested trees, would contribute to two-aged stands in the future. All units would retain at least 10 percent of the mature trees. Requiring trees to be cut to a 10-inch dbh top versus a 6-inch dba top and/or not requiring utility logs to be removed may provide additional cover for red squirrels and other small mammals in the form of additional downed woody debris. Under Alternative 2, Units HS5, HS7, HS12, HS13, and S39 would be selectively harvested. Under Alternative 3, Units HS5, HS7, H12, H14, H17, and S42 would be selectively harvested. Under Alternative 4, Unit S41 would be selectively harvested. All units would be selectively harvested under Alternative 5 and none would be under Alternative 6.

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Sitka Black-tailed Deer (*Odocoileus hemionus sitkensis*)

Sitka black-tailed deer are indigenous to coastal regions of Southeast Alaska. They are a major recreation and subsistence species.

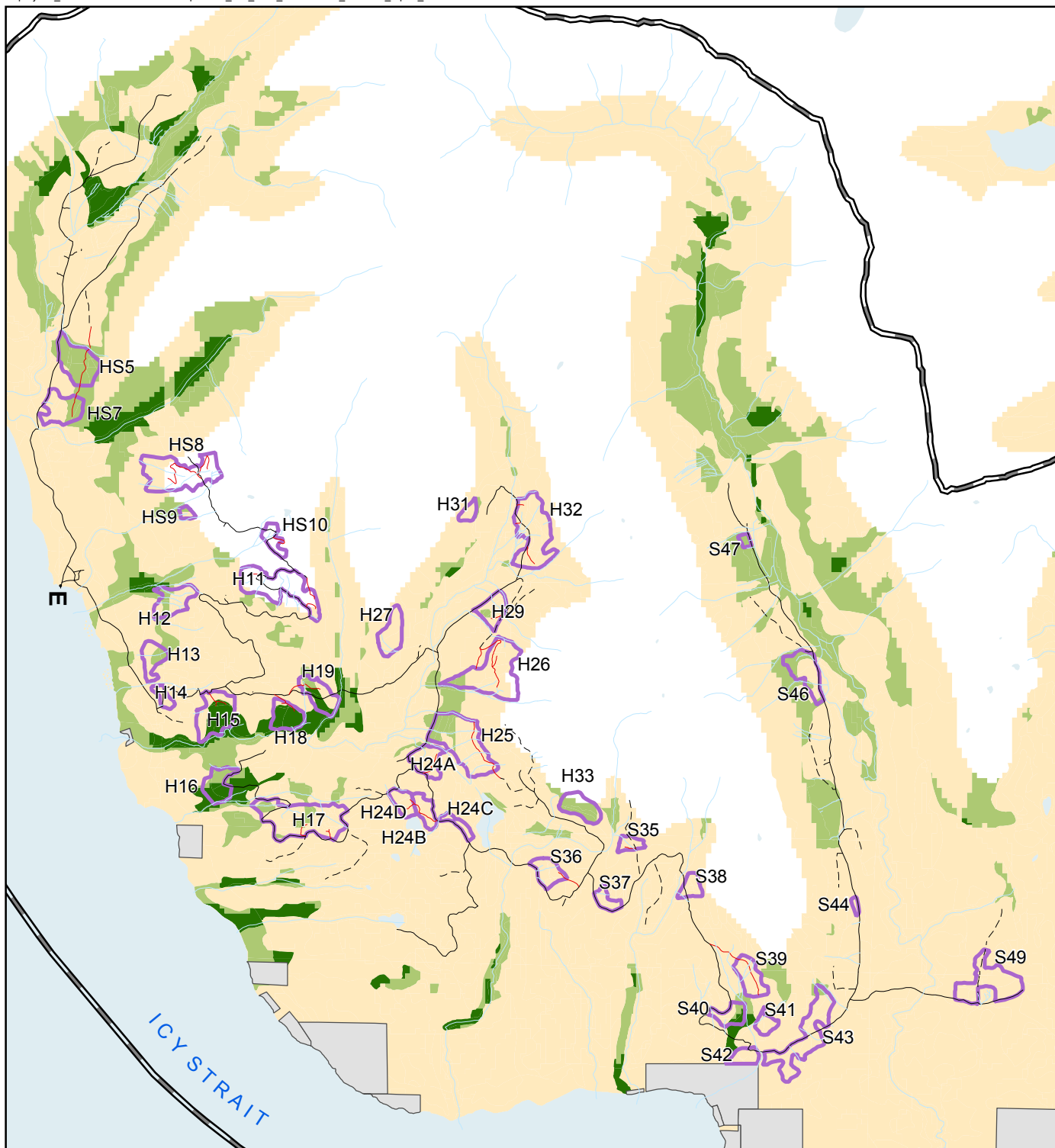
Deer sign was fairly uncommon in the project area. Most sign/visual observations occurred in the Swanson Creek drainage. Deep snow conditions, adverse winter temperatures, and relatively high elevations in the project area likely contribute to relatively low deer densities. The revised deer HCI model (2002) was used to evaluate the potential quality of winter habitat for Sitka black-tailed deer. Model outputs consist of winter HSI scores. The objective of this model is to estimate the capability of habitats in Southeast Alaska to support Sitka black-tailed deer. This species uses lower-elevation, old-growth forests almost exclusively during the winter, especially when snowfall accumulations are high (Suring et al. 1992c). Winter is assumed to be the most limiting season for Sitka black-tailed deer throughout the project area (Hanley and McKendrick 1985). The capability of winter habitat to support Sitka black-tailed deer is a function of forage abundance and quality (Hanley et al. 1989), snow interception qualities of the overstory (Hanley and Rose 1987, Kirchhoff and Schoen 1987), and climate as influenced by aspect, elevation, and maritime conditions (Hanley and Rose 1987). Deer populations also respond to predation pressure and hunting mortality. Predation by gray wolves in particular is thought to significantly retard the recovery of the deer herd from mortality resulting from deep-snow winters (Smith et al. 1986).

Good-quality winter range for deer include of the following characteristics: 1) mature Sitka spruce and western hemlock forest with at least 30 mbf per acre, 2) an area below 800 feet elevation, and 3) south, east, or west aspect (Kessler 1982, Hanley et al. 1989). Optimum winter deer habitat during deep-snow conditions an understory of abundant bunchberry (*Cornus canadensis*), five-leaf bramble (*Rubus pedatus*), and *Vaccinium* species. (Kessler 1982, Hanley et al. 1989).

Although deer in Southeast Alaska are generally considered an old-growth-dependent species (Suring et al. 1992c, Kessler 1982), this species forages extensively in young growth, particularly during mild winters (DellaSala et al. 1993), spring, and summer (Kessler 1982). During the first 10 years after clearing, second-growth forests show a dramatic increase in the production of plants that are the primary winter forage for deer (Suring et al. 1992a). After approximately 25 years, created openings begin forming a dense, closed-canopy young forest, resulting in a rapid reduction of nutritious understory forage for deer. An understory begins to develop again as stands reach 120 to 160 years of age (Suring et al. 1992a). The value of these areas as deer habitat continues to increase as the forest matures into old-growth forest. Thinning young stands may prolong the production of forage plants beyond 25 years.

Deer Winter Habitat Assessment

The revised version of the deer winter habitat model (2002) was used to identify high-value habitat areas within the project area, and maps were generated in GIS (Figure 3-3). As part of the ongoing monitoring and evaluation review of the 1997 Revised Forest Plan, some recommended changes to the deer model were used for this analysis (USDA Forest Service 2001, page 2-155). The model adopted a density of 100 deer per square mile for determining a maximum long-term carrying capacity and



Legend

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- Non-NFS Land

HSI

- Low-value Habitat
- Medium-value Habitat
- High-value Habitat
- Water Body

Figure 3-3
Deer Habitat



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corresponded to habitat scores of 1.0. The 36 percent reduction of deer habitat scores was not applied when estimating deer available to wolves. Lastly, 18 deer per square mile were used as a guideline for the minimum level to support wolves. However, HSI values were reduced by 36 percent to account for deer harvest from hunting. These results are discussed further in the Subsistence section (Chapter 3, Other Environmental Considerations section).

HSI values were grouped into three categories of winter range quality: high (HSI equal to or greater than 0.6), medium (HSI ranges from 0.3 to 0.59), low (HSI ranges from less than 0.01 to 0.29). Winter range quality categories, which are based on area-specific model results, are ways to rank habitat quality in a relative sense. They were defined for this project based on others conducted on the Tongass National Forest. Using this ranking system, the project area was evaluated for deer winter range quality.

Under existing conditions, approximately 852 acres (less than 2 percent) of the 49,522-acre project area contains high-quality habitat and 3,923 acres (8 percent) contain medium-quality habitat within the project area (Table 3-15). High- and medium-quality winter ranges primarily reflect the availability of high- and medium-volume old-growth forest with suitable slopes, aspect, and elevation as defined by the habitat capability model. In contrast, approximately 44,747 acres (90 percent) of low-quality winter range or non-habitat are located in the project area (Table 3-15).

Table 3-15
Number of Acres Associated with Deer Habitat Capability Model HSI Output by VCUs within the Project Area

HSI Grouping	VCU				Total ^{1/}
	1170	1180	1190	1200	
Low (0.01 to 0.29)	10,149	12,420	13,498	8,680	44,747
Medium (0.3 to 0.59)	893	1,220	1,004	806	3,923
High (>0.6)	147	89	366	250	852
Total	11,189	13,729	14,869	9,736	49,522

^{1/} Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

Differences in carrying capacity of winter range for deer in Southeast Alaska vary according to availability and quality of forage. Availability of forage to deer is related to production of forage in the habitat and how much forage is covered by snow (Suring et al. 1992c).

Current deer habitat capability for wildlife analysis areas (WAA) 2305 and 2306 was calculated by multiplying the acreages of low-, medium-, and high-value deer winter range by a maximum long-term carrying capacity of 100 deer per square mile. The long-term carrying capacity was derived from the deer model. The WAA scale was used because it allows comparison with the Forest Plan, and WAAs correspond to the "minor harvest areas" used by ADF&G. Estimates of potential population densities of deer were based on professional experience and a literature review of materials from Southeast Alaska and British Columbia. It was assumed that maximum long-term

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carrying capacity in areas of low snow depth was 100 deer per square mile (Suring et al. 1992c, USDA Forest Service 2001).

In addition, stand exam data were analyzed using the Quick-Cruise Method for Assessing Deer Winter Range in Southeast Alaska (Kirchhoff and Hanley 1992). Totals were compared to mapped HSI values from the deer model in an effort to field verify model output generated for the project area. Results of the Quick-Cruise assessment provide similar results from the deer model. The average score of 49 out of 100, based on plots taken within the proposed unit pool, indicates that the proposed unit pool does not provide large amounts of good quality black-tailed deer habitat. Good quality habitat is typically defined by scores of 65 or greater.

Direct and Indirect Effects on Sitka Black-tailed Deer

Based on the deer model outputs, current estimated deer habitat capability for WAA 2305 and 2306 combined is 2,715 deer, or 21.5 deer per square mile (Table 3-16). This output is not an actual population number, but it is a theoretical long-term carrying capacity for the habitat in the area, given normal winter conditions. The number is useful for purposes of comparing potential impacts to habitat capability among timber harvest alternatives. Figure 3-3 indicates that Units H15, H18, and H19 may remove some of the highest-value deer habitat within the project area based on model output. These four units are parts of Alternatives 2 and 3. Alternative 4 includes Unit HS5 and Alternative 6 includes Unit H15. Alternative 5 includes portions of H15 and H16 within 500 feet of existing the road.

The deer model is a useful comparison tool for evaluating the potential effects of proposed land management activities on Sitka black-tailed deer and species that rely on them as a prey base. Under all of the alternatives, deer habitat capability would be reduced by less than 1.25 percent immediately following harvest. The action alternatives propose harvesting timber that would result in a 0.29 to 1.22 percent reduction in long-term habitat capability immediately after the project, depending on alternative. Twenty-five years after harvest, the percent decreases range from 0.43 to 1.40 percent, depending on the alternative (Table 3-16),

Table 3-16
Habitat Capability for Sitka Black-tailed Deer Immediately Post Project and 25 Years Post Project for WAAs 2305 and 2306

Immediately Post Project – By Alternative ^{1/}						
	1	2	3	4	5	6
Number of Deer	2,716	2,683	2,688	2,698	2,708	2,707
Percent Decrease		1.22%	1.03%	0.64%	0.29%	0.31%
Number of Deer/mi ²	21.5	21.2	21.3	21.4	21.4	21.4
25 Years After Project – By Alternative ^{1/}						
	1	2	3	4	5	6
Number of Deer	2,716	2,678	2,683	2,694	2,704	2,703
Percent Decrease		1.40%	1.20%	0.80%	0.43%	0.45%
Number of Deer/mi ²	21.5	21.2	21.3	21.4	21.4	21.4

^{1/} Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

Note: Deer/mi² = deer per square mile

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because most of the stands would enter into the stem exclusion stage, providing little forage for deer.

In terms of changes in the number of deer per square mile by action alternative, Alternative 2 would have the greatest effect on project-related habitat capability. Alternatives 4, 5, and 6 would have the least effect with similar results. The projected decreases in the number of deer (generated from the deer model) is small, for both immediately post harvest and 25 years out, 1.4 percent or less under any of the action alternatives. In terms of habitat loss from timber harvest, Alternative 2 would remove the greatest amount of POG, followed by Alternatives, 3, 4, 5, and 6 (Table 3-12).

Overall, the model results indicate that there is very little high-quality deer habitat (less than 2 percent) within the Couverden project area (Table 3-15). Based on deer harvest data, very few deer are taken from the project area (see the Subsistence Resource Report). Most documented deer harvest comes from VCU 1200, which incorporates much of the beach fringe, and is more easily accessible to hunters. Nearly all of the 1,000-foot beach fringe is productive old-growth forest and provides important deer winter habitat and connectivity to adjacent areas.

Mountain Goat (*Oreamnos americanus*)

Mountain goats represent species that use cliffs, alpine and subalpine, and old-growth forest habitats. The quantity and quality of winter habitat is the most limiting factor for mountain goats in Southeast Alaska (USDA Forest Service 1997a). Old-growth trees have the highest value because they intercept snow and provide understory forage plants. Behavioral strategies used by mountain goats to avoid predators, particularly wolves, also affect habitat use by mountain goats. The need for escape terrain in close proximity is a critical factor in describing habitat for mountain goats (Suring et al. 1988b). Mountain goats move into steep and broken terrain when approached by wolves.

Populations of mountain goats are very sensitive to human disturbance, especially those populations that are hunted. For the period between 1986 and 2001, ADF&G reports that no goats were harvested in the project area (see the Subsistence Resource Report). The project area is used to access goats north of the project area. Mountain goats were documented on the ridges associated with the alpine areas north of the immediate project area.

The winter goat habitat suitability index model was used to evaluate the potential impacts of timber harvest on mountain goats in the Couverden area. The primary considerations in the evaluation of mountain goat habitat in Southeast Alaska are availability of food and proximity to escape terrain.

Direct and Indirect Effects on Mountain Goats

No direct effects are anticipated for the mountain goat. The greatest potential impact to mountain goats is from increased access to hunters. HSI model output assisted Forest Service personnel in identifying areas on which to concentrate during habitat surveys conducted in July 2002. Six units with an HSI value of 0.8 or higher were visited. Overall, the areas proved to be very poor goat habitat. No goat sign was found in any of the units that had an HSI value of 0.8 or higher. This is likely correlated to lack of escape cover.

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None of the proposed roads would improve access for hunters to mountain goat habitat north of the project area than the existing road system. Therefore, new road construction under any of the alternatives would not affect mountain goats.

Additional Species of Concern

This section addresses USFWS Species of Concern (SOCs) as well as other SOIs such as moose, waterfowl, and wading birds (Table 3-11). Although SOCs that are former USFWS candidate species receive no special protection under the Endangered Species Act (ESA), USFWS recommends analysis of project impacts on these species.

A total of nine SOCs or SOIs are known or have the potential to occur within the project area and are listed in Table 3-11. The spotted frog, olive-sided flycatcher, Kittlitz's murrelet (a candidate species for listing under ESA), and moose are described in detail in the Wildlife Resource Report (Foster Wheeler Environmental 2003a). USFWS recently designated the Kittlitz's murrelet as a candidate for listing as a threatened or endangered species because its numbers have declined sharply. The largest known populations of Kittlitz's murrelet occur in Southeast and Southcentral Alaska. Sometimes referred to as the "glacier murrelet," the Kittlitz's murrelet forages almost exclusively at the face of tidewater glaciers or near the outflow of glacier streams and nests in alpine areas in bare patches among the ice and snow. Brady Glacier is the tidewater glacier closest to the project area and is located in Glacier Bay National Park, approximately 75 miles west of the project area. For the aforementioned species, there are no anticipated direct, indirect, or cumulative effects due to implementation of current Forest-wide Standards and Guidelines; therefore, these species are not included in the discussion below.

This section also includes migratory birds, birds of conservation concern, and other bird species identified as a priority by the USFWS.

Marbled Murrelet (*Brachyramphus marmoratus*)

The marbled murrelet is a small seabird found throughout the north Pacific. Murrelets feed on small fish and invertebrates in near-shore ocean areas, inland saltwater, and occasionally on inland freshwater lakes. During the breeding season, murrelets are more dispersed but will still concentrate in feeding areas during the day. Murrelets are highly mobile in their search for foraging areas, suggesting a high level of population interaction.

The marbled murrelet is listed as a threatened species in Washington, Oregon, and California. There is an increasing concern for this species in Alaska. The Forest Plan states, "The listing of this species in WA, OR, and CA and the reductions in habitat from timber harvesting, have raised concerns for the viability of this species in Southeast Alaska" (USDA Forest Service 1997b). Population trends are considered to trend downward for all populations that rely on large, commercially valuable conifers for nesting. Estimates of murrelet numbers in Southeast Alaska range from 45,000 to 250,000 (DeGange 1996).

Marbled murrelets generally select old-growth stands and large-diameter trees as nest sites (Ralph and Miller 1995, DeGange 1996, Kuletz et al. 1995). A small percentage (less than 10 percent) of birds may nest on the

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ground (DeGange 1996). Large limbs of old-growth trees are the preferred area for nest placement. Kuletz et al. (1995) stated that the best predictor of marbled murrelet activity and occupied behaviors was location relative to heads of bays, tree size, epiphyte cover on trees, and number of platforms in south-central Alaska.

A coarse filter analysis of GIS data layers was conducted to quantify the amount of suitable marbled murrelet habitat that currently exists in the project area. Suitable marbled murrelet habitat was defined as medium- and high-volume forest regardless of elevation. Higher-volume, lower-elevation stands are more likely to be used, however, than higher-elevation stands based on previous studies and known occupied stands in Washington and Oregon. In addition, volume class 6 stands were also used to assess important coarse canopy stands within the project area (there are no volume class 7 stands within the project area). Coarse canopy old-growth habitats may provide better nesting habitat for marbled murrelets than just medium- and high-volume forested stands. Table 3-17 shows the amount of medium- and high-volume old-growth by elevation and associated volume class 6 strata. Approximately 16,755 acres (or 74 percent) of the existing POG in the project area is considered suitable marbled murrelet habitat.

A total of 1,846 acres of coarse canopy (i.e., volume class 6) habitat exists within the project area. Forty-seven percent of coarse canopy structure occurs in medium- and high-volume old-growth forest at less than 800 feet in elevation with 86 percent occurring below 1,500 feet in elevation. Coarse canopy structure comprises 11 percent of the medium- and high-volume old-growth and 4 percent of the total 49,522-acre project area.

Table 3-17

Total Medium- and High-volume Old-growth Acres by Volume Strata, Coarse Canopy, and Percentage of POG Acres by Elevation Class and Volume Strata, within the 49,522-acre Couverden Project Area^{1/}

Volume Strata	Acres by Elevation Class (acres of Volume Class 6) ^{2/, 3/}			Total Acres	Percent of Medium/High POG Acres within Project area by Volume and Volume Class 6
	<800 Feet	800 to 1,500 Feet	>1,500 Feet		
High Volume	4,044 (809)	3,942 (708)	1,706 (266)	9,692 (1783)	43% (97%)
Medium Volume	4,677 (51)	1,789 (12)	635 (0)	7,100 (63)	31% (3%)
Total Acres	8,721 (860)	5,730 (721)	2,341 (266)	16,792 (1,847)	74% (100%)
Percent Medium/High POG by Elevation within Project Area and (Volume Class 6)	52% (47%)	34% (39%)	14% (14%)	100% (100%)	

^{1/} Acres of high structure/coarse canopy habitat is described as Volume Class 6 and 7 and amounts are shown in parentheses.

^{2/} No volume class 7 exists within the project area. Acres of Volume 6 are noted in parentheses.

^{3/} High volume includes timber classified as high and very high.

^{4/} Percentages are based on a total of 22,721 acres of POG within the 49,522-acre project area; approximately 74 percent of the POG found within the project area consist of medium and high volume strata.

Note: Acreages from GIS coverages may vary slightly with other tables due to rounding or differences in calculated acres by elevation. Numbers are not exact due to rounding.

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Direct and Indirect Effects on Marbled Murrelets

Marbled murrelet surveys were conducted within the Homeshore and Swanson Creek drainages in June 2002. Based on these surveys, murrelets were detected in both drainages and likely nest in the area. Suspected nesting was documented near a proposed harvest unit within the existing small OGR.

Table 3-5 shows the acres of high-, medium-, and low-volume old-growth forest potentially harvested under each alternative. The alternative that would remove the most medium- and high-volume old-growth forest is Alternative 2 (850 acres). Alternative 6 would remove the least (162 acres). These values represent approximately 5 percent and 1 percent of the combined high- and medium-volume, old-growth forest within the project area, respectively. The proposed alternatives ranking from most effect to least effect on marbled murrelet habitat (e.g., medium- and high-volume old-growth stands) are Alternatives 2, 3, 4, 5, and 6. Disturbance from helicopter logging and transportation crews and equipment can affect nesting murrelets. If any nests are found during project implementation, Forest Plan Standards and Guidelines require maintaining a 600-foot radius buffer around the nest and minimizing activities within the buffer during the nesting season (May 1 to August 15).

Table 3-5 also shows the amount of coarse canopy habitat by volume class (values in parenthesis). Volume classes 6 and 7 have been identified as providing important structural characteristics for nesting habitat for marbled murrelets, denning habitat for marten, and winter cover for Sitka black-tailed deer. No volume class 7 exists within the project area, but a total of 1,847 acres of volume class 6 has been identified in the project area with 106 acres delineated within the proposed unit pool. Units HS5 and S46 have the most coarse canopy structure totaling 47 acres and 15 acres, respectively. Units HS7 and HS26 also have 11 acres and 2 acres identified, respectively. Alternative 2 would remove 60 acres, followed by Alternative 3 (48 acres), Alternative 4 (16 acres), and Alternative 5 (13 acres). Alternative 6 would not remove any coarse canopy structure. Less than 3 percent of the total coarse canopy habitat identified within the project area would be removed under any of the alternatives.

Direct, indirect, or cumulative effects to marbled murrelet habitat on a landscape level are not expected because the amount of suitable nesting habitat proposed for timber harvest is small. Less than 9 percent of the total medium- and high-volume old-growth forest could be removed under any of the proposed alternatives. Other direct effects include disturbance due to helicopter logging under Alternatives 2 and 4. Forest Plan Standards and Guidelines require maintaining a 600-foot undisturbed buffer around any identified marbled murrelet nest, with timing restrictions to minimize disturbance if an active nest is located during implementation.

Indirect effects would be associated with fragmentation and patch size reduction of suitable habitat for the marbled murrelet. Habitat removal would affect forest fragmentation and connectivity by potentially reducing the effectiveness of interior habitat and increasing the potential for nest-site predation from avian predators that are associated with forest edges and fragmented landscapes.

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Waterfowl and Wading Birds	Important areas for waterfowl in the project area include estuaries, streams, lakes, muskeg ponds, and beaver ponds. Mudflat surveys were conducted during low tide at each of the three main estuaries (Homeshore, Humpy, and Swanson Creeks). Mudflat surveys were conducted during mid- to late-June, 2002. No shorebird concentrations or rookeries were observed (Foster Wheeler Environmental 2003a).
Harlequin Ducks	Harlequin ducks (<i>Histrionicus histrionicus</i>) nest along fast-moving inland streams. Rafts of harlequin ducks were recorded at Homeshore and Humpy estuaries. It is possible that nesting may occur within the project area; however, no nesting activities were noted during field surveys.
Vancouver Canada Goose	The Vancouver Canada goose (<i>Branta canadensis fulva</i>), a MIS on the Tongass National Forest, is distributed throughout Southeast Alaska (USDA Forest Service 1997b). The Vancouver Canada goose uses forested and non-forested wetlands in estuary, riparian, and upland areas of the forest (USDA Forest Service 1997b). No geese were documented during surveys conducted in the estuary areas of Homeshore, Humpy, and Swanson Creeks; however, a Vancouver Canada goose with a brood of seven goslings was seen near the lake adjacent to Unit H24.
Great Blue Herons	Great blue herons (<i>Ardea herodias</i>) occur near most types of fresh and saltwater wetlands, including seashores, rivers, swamps, marshes, and ditches. One great blue heron was documented foraging at the estuary of Humpy and Homeshore creeks. No more than one bird was observed at any one time and observed flight direction did not give any indication of possible nesting in the immediate area of the project.
Direct and Indirect Effects on Waterfowl and Wading Birds	No direct or indirect effects are anticipated for waterfowl or wading birds. No timber harvest would occur in the RMAs based on the Forest Plan Riparian Standards and Guidelines. In addition, Forest Plan Standards and Guidelines maintain buffers along shorelines, estuaries, lakes, and around all Class I and II streams. Under all action alternatives, there is a high level of riparian protection through mandatory and site-specific design considerations. In addition to riparian habitat and function protection, beach and estuary buffers will also provide added habitat protection. No effects to waterfowl nesting and foraging habitat are anticipated.

Migratory Birds, Birds of Conservation Concern, and Priority Species

The term "Birds of Conservation Concern" is a USFWS designation (USFWS 2002). They are called "Priority Species" in the Landbird Conservation Plan for Alaska Biogeographic Regions (Boreal Partners in Flight Working Group 1999). Executive Order 13186, dated January 10, 2001, and the Memorandum of Understanding between the USDA Forest Service and USFWS both call for the protection of migratory birds, including neotropical migrants. The Executive Order directs federal agencies to take conservation actions for birds and consider effects in the National Environmental Policy Act (NEPA) process. Table 3-18 shows the priority bird species that are likely to occur (or known to occur) in the project area.

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Table 3-18 includes only those bird species that prefer and use spruce-hemlock forest types for all or part of their life. They are also either known or suspected to breed on the Tongass National Forest. The list of species was derived from the Bird Conservation Region (BCR 5—North Pacific Rainforest) and the Landbird Conservation Plan for Alaska Biogeographic Regions. No activities are proposed in the other habitats of the project area; therefore, no effects to other migratory birds or species of conservation concern are expected.

The Migratory Bird Treaty Act of 1918 (amended in 1936 and 1972) prohibits the taking of migratory birds unless authorized by the Secretary of Interior. Treaties have been developed between the United States, Great Britain, Mexico, and Japan to manage the resource.

Table 3-18
Birds of Conservation Concern and Priority Species that are Likely to Occur (or known to occur) within the Couverden Project Area^{1/}

Common Name	Scientific Name	Occurrence ^{2/}	Abundance ^{3/}
blue grouse	<i>Dendragapus obscurus</i>	B, W	common
western screech-owl	<i>Otus kennicottii</i>	B, W	uncommon
Vaux's swift	<i>Chaetura vauxi</i>	M, B*	uncommon
rufous hummingbird	<i>Selasphorus rufus</i>	M, B	common
red-breasted sapsucker ^{4/}	<i>Sphyrapicus rubber</i>	B	abundant
Pacific-slope flycatcher	<i>Empidonax difficilis</i>	B	common
Steller's jay	<i>Cyanocitta stelleri</i>	B, W	abundant
northwestern crow	<i>Corvus caurinus</i>	B, W	abundant
Chestnut-backed chickadee	<i>Poecile rufescens</i>	B, W	abundant
golden-crowned kinglet	<i>Regulus satrapa</i>	B, W	common
varied thrush	<i>Ixoreus naevius</i>	M, B, W	abundant
Townsend's warbler	<i>Dendroica townsendi</i>	B	common
blackpoll warbler	<i>Dendroica striata</i>	M	rare ^{1/}
northern goshawk ^{4/}	<i>Accipiter gentilis laingi</i>	B, W	uncommon
marbled murrelet ^{4/}	<i>Brachyramphus marmoratus</i>	B, W	common

1/ These species are primarily associated with the coastal hemlock-Sitka spruce forest type.

2/ Occurrence: B=Breeding W=Winter M=Migration *=no record, but thought to breed

3/ Abundance: 1=migration only

4/ These species are discussed in detail in the wildlife or TES section of this document.

Direct and Indirect Effects

Some direct effects to nesting birds will occur in all of the alternatives that propose timber harvest. The primary effect would be loss of habitat, nest destruction, or abandonment. The magnitude of the effects will vary depending on the alternative that is selected and the season in which the harvest occurs. Nesting in Southeast Alaska generally begins in May. By September, the birds are fledged and will not be directly affected (Gwen Baluss, personal communication, Tongass National Forest, Juneau Ranger District).

Indirect effects would be associated with fragmentation and patch size reduction of suitable habitat. For species such as northern goshawk, marbled murrelet, and Townsend's warbler, habitat removal would affect forest fragmentation by potentially reducing the effectiveness of interior habitat and

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Alexander Archipelago Wolf (*Canis lupus ligoni*)

increasing the potential for nest-site predation from avian predators that are associated with forest edges and fragmented landscapes. Other species may be more associated with forest edge, riparian, or more open habitats; therefore, the effects from timber harvest would likely be negligible.

Two Alaskan subspecies of the gray wolf are currently recognized. The wolf found in Southeast Alaska is known as the Alexander Archipelago wolf. It inhabits the mainland and the islands south of Frederick Sound. The total population is estimated at fewer than 1,000 individuals in all of Southeast Alaska, with approximately 200 being harvested annually (Kirchhoff 1991). Although wolves are listed as threatened or endangered in the contiguous 48 states, they are not listed in Alaska. They are SOC and MIS on the Tongass National Forest. The commitment of the Forest Service to revise its Forest Plan to adequately protect habitat for the Queen Charlotte goshawk and other species associated with old-growth forests was an important element in the USFWS decision not to list the wolf in Alaska.

Kirchhoff (1991) identified four factors that could place this subspecies at risk:

1. Liberal trapping and hunting regulations,
2. High road densities,
3. Reduced prey populations in areas subject to intensive logging, and
4. Inbreeding depression within the insular population.

Two viability concerns exist for the wolf on the Tongass National Forest:

1. Short-term increases in harvest, and
2. Long-term large reductions in deer habitat capability (USDA Forest Service 1997b).

Roads increase the risk to wolf population viability due to the high level of hunting, trapping, and poaching that occurs along roads. Pletscher (1994) recommends a road-density threshold of no more than 1 mile of open road per square mile for wolves. The Forest Plan recommends 0.7 to 1.0 mile of open road per square mile.

Wolves in Southeast Alaska prey on Sitka black-tailed deer, moose, mountain goat, beaver, black bear, spawning salmon, and geese. Deer habitat capability is believed to be a significant factor affecting the viability of wolf populations. Based on output derived from the revised deer HCI model (Suring et al. 1992c, and revised in 2002), it was estimated that there are 21.5 deer per square mile within the project area (see Section 4.4.8.1, Sitka Black-tailed Deer).

In the Wolf Standard and Guidelines Implementation Policy Clarification (USDA Forest Service 1998), the Forest Service recommends a habitat capability of 17 deer per square mile to meet both sustainable wolf populations and human deer harvest demands. Recently, it was recommended to use 18 deer per square mile as a guideline for the minimum carrying capacity to support wolves (USDA Forest Service 2001, page 2-155). These values are used to make relative comparisons between alternatives, not as actual population estimations.

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Wolf sign was documented during the 2002 field surveys. A wolf was observed near the southern end of Unit S43. A few scat piles were seen on roads throughout the project area. No audio detection was documented. Wolves do use the area and have been documented in the past. As many as 15 wolves were recorded on the road system in 2002 by Forest Service personnel.

A total of 10 wolves have been harvested from the project area from 1984 through 2000 (see Subsistence Resource Report). Eighty percent of the recorded wolf harvests were taken from Minor 0601, which corresponds to VCU 1200.

Direct and Indirect Effects on Alexander Archipelago Wolves

Based on the deer model outputs, the action alternatives for the Couverden project area would result in a habitat capability ranging from 21.2 to 21.4 deer per square mile, depending on alternative (see discussion of Sitka black-tailed deer). All four VCUs in the project area provide greater than the recommended 18 deer per square mile and none of the action alternatives would reduce estimated densities below this figure. Effects of the proposed timber harvest on deer habitat capability would be greatest under Alternative 2, followed by Alternative 3, 4, 5, and 6 (all of which show the same habitat capability value). Although the primary prey species for the wolf in the area is the Sitka black-tailed deer, on the mainland and in the vicinity of the project area, other prey species such as moose, mountain goat, and beaver are important prey items. In particular, moose may also be a prey item for wolves within the project area. Moose sign was common, especially near existing roads through previously harvested units. All of the action alternatives would temporarily enhance moose habitat (for about 25 years) by creating new forage areas.

The primary effect of the Couverden project area on the wolf population is dependent on the impact to the deer population, discussed briefly above, and on the level of roading under each alternative (Table 3-19). Historically,

Table 3-19
Number of Miles per Square Mile of Proposed Road by Alternative within the 49,522-acre Couverden Project Area by VCU

VCU	Existing Condition Road Miles and Road Density (mi/mi ²)	Alternative by Road Miles and Road Density (mi/mi ²)				
		2	3	4	5	6
1170	0.0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1180	6.2 (0.29)	0 (0.29)	0 (0.29)	4.2 (0.48)	0 (0.29)	0 (0.29)
1190	14.1 (0.61)	5.3 (0.83)	4.6 (0.80)	2.1 (0.70)	0 (0.61)	0.8 (0.64)
1200	15.3 (1.01)	2.4 (1.17)	2.2 (1.15)	0.7 (1.06)	0 (1.01)	0.1 (1.01)
New Classified Road ^{1/}		4.3	3.4	1.4	0.0	0.4
New Temporary Road		3.5	3.5	2.6	0.0	0.5
Total Road Density ^{2/}	0.46	0.56	0.55	0.55	0.46	0.55

^{1/} Includes open classified roads and closed classified roads.

^{2/} Includes temporary roads that will be obliterated after harvest.

Note: Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

mi/mi² = miles per square mile

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approximately 45.5 miles of roads have been constructed during previous harvest entries within the Couverden project area. Of these miles, 35.7 miles are classified roads and 9.8 miles are unclassified roads. The unclassified roads (former temporary roads) were closed and are in various stages of revegetation. Some are usable as OHV trails.

Although relatively few wolves have been harvested according to ADF&G harvest data, hunting of wolves could increase with the increase in accessibility. Alternative 2 would have more miles of road than other alternatives. Among the action alternatives, Alternative 5 would have the least effect as this alternative does not propose any new road. The existing road density within the Couverden project area is 0.5 mile per square mile. Regardless of alternative, road densities would remain at or below 0.6 mile of open road per square mile. The lower limit stated in the standards and guidelines for wolf management in the Forest Plan is 0.7 to 1.0 mile of open road per square mile. Increases in road densities for all action alternatives range from 0.0 to 0.2 mile per square mile depending on VCU. The overall road densities within the project area would remain at or below 0.6 mile per square mile.

Perhaps even more important than road density is the potential impact that roaded access would have on an already small deer population. This area does not appear to be hunted heavily, even for subsistence (Foster Wheeler Environmental 2003d). All new roads would be closed after harvest, which would reduce the potential deer and wolf harvest. Even closed roads provide walking corridors that would be used by hunters and most could be accessed by OHVs. Although the project is not expected to have significant effects on the prey species, in particular Sitka black-tailed deer, wolves may be affected by the increase in access for hunters. In terms of the number of miles of new road construction or reconstruction, Alternative 2 would have the overall greatest effect on wolves (7.8 miles new temporary and classified road), followed by Alternative 3 (6.8 miles), Alternative 4 (4.0 miles), Alternative 6 (0.9 mile), and Alternative 5 (0.0 mile). Under Alternative 4, a total of 2.9 miles of an closed classified road would be re-opened. All proposed roads would be closed to motorized vehicles after the completion of harvest activities. Roads would be closed at the first practical point, either by tank trap at the beginning of the road, at the first stream crossing, or by official closure order.

Cumulative Effects

The cumulative effects of the Couverden Timber Sale include the effects of this proposed timber harvest and other past, present, and reasonable foreseeable future actions. Actions considered include previous timber harvest activities, associated road construction, and the construction of an existing log transfer facility. Foreseeable actions by the Forest Service include road maintenance and pre-commercial thinning in the Homeshore Creek area. There are no foreseeable actions on over-selected lands within the project area.

The Couverden project area has a logging history dating from 1979. Approximately 2,163 acres of productive old growth was harvested between 1979 and 1992. The action alternatives in the proposed project would

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remove between 1,521 acres and 171 acres of productive old growth, depending on the alternative. There are no other planned or expected timber sales on NFS land within the project area. Approximately 4,975 acres of state and private land are within the project area. Fifty-six percent of the beach and estuary fringe within the project area is in non-NFS land. No timber harvest or other developments are anticipated on non-NFS land in the reasonably foreseeable future.

Wildlife Habitats None of the alternatives are expected to have any effect on estuary or beach fringe or non-forested habitats in the project area; therefore, no additional cumulative effects are anticipated for these habitat types. Previous harvest entries removed riparian habitat along streams. The amount of acreage removed is not considered significant given the current protection within the RMAs. Riparian areas along 4.2 miles, 4.3 miles, and 4.2 miles of Class I, Class II, and Class III stream riparian buffers, respectively, were altered by past activities. The proposed alternatives and foreseeable actions (pre-commercial thinning and road maintenance) are not expected to add to adverse cumulative effects on riparian areas. Precommercial thinning and road maintenance are expected to result in improving riparian habitat.

Due to the low acreage of wetlands affected by the alternatives, significant cumulative effects are not anticipated from this proposed project. Past activities in the area, however, have included building 17.2 miles in wetlands and harvest of 335 acres in wetlands. Future harvest entries, road building, and associated activities would be designed to minimize adverse effects on wetlands as directed by the Executive Order 11990 and the Forest Plan. Cumulative effects to wetlands by alternative are displayed in Table 3-20. Foreseeable actions are not expected to add to cumulative effects on wetlands.

Table 3-20
Wetland Acres Affected by Cumulative Timber Harvest within the
Couwerden Project Area^{1/}

	Existing Condition	Alternative				
		2	3	4	5	6
Wetland Acres Affected	335	406	413	416	416	347

^{1/} Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

The amount of POG in the project area has been reduced by previous logging and would be further reduced by the proposed action alternatives. Currently, there are 22,723 acres of POG in the project area. Based on all previous harvest entries in the project area, a total of 2,163 acres of POG has been removed, much of it being high-volume stands harvested from lower elevation sites. Approximately 481 acres of this were harvested from VCU 1180, 1,208 acres from VCU 1190, and 474 from VCU 1200 (Table 3-21). This represents approximately a 9 percent reduction. Up to 981 acres (4 percent) of POG could be removed under the proposed alternatives (Table 3-21). No additional programmed harvests are anticipated within the foreseeable future. No additional cumulative effects to

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Table 3-21
Proposed Harvest by VCU and Cumulative Harvest of Productive
Old-growth Forest in Acres and Percent for the Couverden Project Area

	Existing from Previous Timber Harvest	Alternative				
		2	3	4	5	6
VCU 1180	474	0	0	141	43	0
VCU 1190	1208	576	442	309	146	137
VCU 1200	481	371	291	95	153	34
Cumulative Acres of POG Affected by Past and Proposed Harvest	2,163	3,110	2,896	2,708	2,505	2,334
Cumulative Percent Reduction	9%					

Note: Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

POG are expected from foreseeable actions. In a broader geographic context, the Lynn Canal Biogeographic Province comprises approximately 634,759 acres, with an estimated 154,527 acres of POG; 62,844 acres of this is classified as high-volume old-growth forest (USDA Forest Service 2003). Approximately 3 percent of the POG has been removed by past activities. The proposed action alternatives would remove less than 0.01 percent of the remaining POG.

Past harvest and road building have restricted wildlife corridors, especially in the Homeshore watershed. No additional adverse cumulative effects on wildlife corridors are anticipated beyond those discussed under direct effects. Recently completed precommercial thinning in the older harvest units may improve wildlife access through the existing corridor in that watershed by opening up these dense stands and concentrating growth in the remaining trees.

Past timber harvest and road building have added to the high level of fragmentation and edge that occurs naturally in the project area. Harvest in the Homeshore watershed fragmented a large block of old-growth forest into several smaller blocks. Harvest in Humpy and Swanson watersheds also resulted in smaller blocks of old-growth forest and increased edge effects. Implementation of the action alternatives would add cumulatively to the previous effects. The amount of interior forest would be further reduced under the action alternatives, which could range from 2.3 percent under Alternative 6, to 11.8 percent under Alternative 2. Foreseeable actions are not expected to result in additional fragmentation.

Wildlife Species of Concern

Past forest-related activities likely removed bald eagle and river otter habitat within the beach fringe buffer when the LTF was constructed. A total of 25 acres, or less than 1 percent, of the beach fringe was removed during clearing and construction of the existing LTF and log/equipment storage area. No other harvest units were located within the beach fringe or estuary areas and none are proposed under the proposed alternatives. Forest Plan Standards and Guidelines will maintain these habitats so that cumulative

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effects will be reduced. Foreseeable actions, including reconstruction of the LTF, installation of a small boat dock and boat ramp, and road maintenance are not expected to add to cumulative effects on eagles.

Past road building improved access for mountain goat hunters. Road building through wetlands affected spotted frog habitat. Kittlitz's murrelet and waterfowl habitat were not significantly affected by past management, while moose forage habitat was likely improved. Under all alternatives, no direct or indirect effects, thus, no additional cumulative effects are anticipated for mountain goat, spotted frog, Kittlitz's murrelet, moose, and waterfowl and wading birds.

For old-growth forest bird MIS, marbled murrelets, other birds of conservation concern, and red squirrels, logging of POG under the action alternatives would contribute to habitat declines that resulted from previous harvest (Table 3-21). Foreseeable actions are not expected to add to cumulative effects on these species because these activities would not occur in areas of currently productive old-growth forest. Although timber harvest may reduce the number of potential breeding sites for red squirrels, the amount of foraging habitat in the project area may increase in the next decade as current second-growth stands reach seed-producing age. For the marbled murrelet, harvest of medium- and high-volume POG would result in additional decreases in the amount of nesting habitat (Table 3-22).

Table 3-22
Cumulative Harvest of Medium- and High-volume Productive Old-growth Forest in Acres for the Couverden Project Area

Existing from Previous Timber Harvests	Alternative				
	2 (acres)	3 (acres)	4 (acres)	5 (acres)	6 (acres)
2,163	3,013	2,805	2,594	2,391	2,327

Note: Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

Combined with previous harvests, implementation of the action alternatives would contribute to the loss of habitat for black and brown bear. Harvest along Homeshore Creek affected critical foraging areas for brown bear. Black bear use of the older clearcuts would be reduced as these older units mature. Recently completed pre-commercial thinning in the Homeshore area should, however, partially reverse the loss of forage habitat in this area. New harvest units would provide additional forage areas approximately 2 to 3 years after harvest. Foreseeable actions are not expected to add to cumulative effects on black bears, other than a minor positive effect from temporary improvements in forage within thinned units. Critical brown bear foraging habitat and travel corridors would be maintained by Forest Plan Standards and Guidelines; therefore, no additional cumulative effects are expected from the proposed alternatives or from reasonably foreseeable actions. All new roads would be closed to motor vehicle traffic after the project is completed. Roads would be closed at the first practical point, either by tank trap at the beginning of the road, at the first stream crossing,

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or by official closure order. Closed roads generally have fewer adverse effects on game species populations than roads open to motorized vehicles.

The Couverden Timber Sale would further reduce the amount of high-value marten habitat in the project area (high-volume POG below 1,500 feet in elevation). In conjunction with past and foreseeable actions, Alternative 2 would have the greatest cumulative effect on marten habitat loss within the project area, followed in decreasing order of effect by Alternatives 3, 4, 6, and 5. Foreseeable actions would not add to cumulative effects on martens.

Past harvest activities have removed high-value deer habitat, especially in the Homeshore watershed. Implementation of the action alternatives would result in a relatively small cumulative reduction in the amount of suitable deer habitat in the area. Based on HSI scores generated from the deer capability model, current conditions show that 90 percent of the Couverden project area provides little or no suitable deer habitat. Historically, this area probably did not support a large deer population due to extreme winter conditions. Proposed pre-commercial thinning of some older harvest units may improve spring and summer forage for deer in the short term, which may in turn lead to increases in prey availability for Alexander Archipelago gray wolves.

Past project-related activities, primarily road construction, initially provided access to the project area, increasing the potential for hunting pressure on black and brown bear, deer, mountain goat, and wolf populations, as well as trapping for marten. The current road density in the project area is 0.5 mile per square mile, which is below the level at which marten populations have been reported to decline at a greater rate (Suring et al. 1992b). Under all alternatives, the road density in the project area would remain at or below 0.6 mile per square mile, which is the maximum recommended road density for marten. Likewise, road densities would also remain below the 0.7 mile per square mile maximum recommended for the Alexander Archipelago gray wolf (USDA Forest Service 1997b). All new roads would be closed to normal motor vehicle traffic after the project is completed. Roads would be closed at the first practical point, either by tank trap at the beginning of the road, at the first stream crossing, or by official closure order. Closed roads generally have fewer adverse effects on game species populations than roads open to normal motor vehicle traffic. Even closed roads may reduce habitat quality due to the potential for interactions with people hiking or using OHVs and mountain bikes on closed roads.

Issue 3: Timber Sale Economics

Affected Environment

The affected environment portion of this section is divided into two main parts. The first part briefly discusses the local economy, with specific reference to employment in Southeast Alaska and the communities surrounding the project area. The second part discusses the timber industry and focuses on forest products employment and timber supply and market demand.

Employment and the Economy

Employment in Southeast Alaska

The Tongass National Forest includes approximately 80 percent of the land area in Southeast Alaska. The region is sparsely settled. Approximately 74,000 people live in 33 towns and villages located in and around the Forest, with approximately 31,000 people or 42 percent of the total population living in Juneau. The communities of Southeast Alaska depend on the Tongass National Forest in various ways, including employment in the wood products, commercial fishing and fish processing, recreation and tourism, and mining and mineral development sectors. Many residents also depend heavily on subsistence hunting and fishing to meet their basic needs. In addition, natural amenities and recreation activities associated with the Tongass National Forest form an important part of the quality of life for many residents of Southeast Alaska. There is very little private land in the region to provide these resources. Appropriate management of the Tongass National Forest's natural resources is, therefore, extremely important for local communities and the overall regional economy.

Average annual employment in Southeast Alaska increased by approximately 4,891 jobs or 10 percent between 1990 and 2000, despite large reductions in wood products employment. Growth in employment opportunities between 1990 and 2000 was, however, lower than the national average, as was growth in the local population. Much of the job creation that occurred in the region was in the lower paid retail and service sectors, resulting in a steady erosion in average earnings per job and the contribution of job-related earnings to per capita income. Decreases in job-related earnings as a share of income is a widespread phenomenon that has been observed throughout the United States. Population and per capita income are discussed in more detail in the Socioeconomics section of this document.

Comparison with national employment levels indicates that Southeast Alaska's economy is relatively specialized in the government, transportation and utilities, and agricultural, forestry, and fishing sectors. The concentration of employment in the government sector, which is approximately twice the national average, reflects the location of the state capital in Juneau, but the relatively high proportion of government employment in other communities in Southeast Alaska also plays a part. Recreation and tourism are also heavily represented in the economy of Southeast Alaska, accounting for an estimated 11 percent of total regional

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employment in 2001 and outfitter/guide use on the Tongass has grown in recent years (USDA Forest Service 2003).

Wholesale trade and the finance, insurance, and real estate sector are relatively underrepresented, reflecting the region's propensity to import these goods and services from the lower 48 states. Manufacturing is also underrepresented despite certain basic industries, primarily wood products and seafood processing, partially offsetting the lack of a more developed local manufacturing base.

As noted in the Socioeconomics section of this document, average annual earnings in the recreation, wood products, and mining sectors were \$20,757, \$44,330, and \$68,288 in 2001, respectively (USDA Forest Service 2003). Recreation and tourism jobs tend to be seasonal and nonresidents make up a relatively large share of employment in the recreation and tourism sector in Southeast Alaska, accounting for approximately 55 percent of total employment in 1994. Nonresidents make up a smaller share of total employment in the wood products and mining sectors, accounting for approximately 35 percent and 22 percent of total employment in 1994, respectively (USDA Forest Service 2003). Logging jobs also tend to be seasonal.

Employment in the Local Area

Five communities near the Couverden project area could be affected by the project: Excursion Inlet, Gustavus, Hoonah, Haines, and Juneau. The following paragraphs provide a brief overview of employment in these five communities. Additional detail on these communities is available in the 1997 Forest Plan FEIS and the Forest Plan Wilderness Supplemental Environmental Impact Statement (SEIS) (USDA Forest Service 1997b, 2003).

Excursion Inlet, the closest community to the Couverden project area, had an estimated population of 12 in 2003 and a total of 2 residents employed in 2000. Only 8 of the 85 homes in the Excursion Inlet area are permanently occupied. The remainder are used as weekend recreation cabins (Alaska Department of Community and Economic Development [DCED] 2004). Seasonal employment is provided in the area by the fish processing plant formerly operated in Excursion Inlet by Wards Cove Packing Co., now owned and operated by Ocean Beauty Seafoods.

Gustavus, located approximately 20 miles northwest of the Couverden project area, had an estimated population of 438 in 2003 and a total of 190 residents employed in 2000. The economy in Gustavus is largely seasonal, due in part to its proximity to Glacier Bay National Park. The park lodge, airport, school, small businesses, and the Park Service are the primary employers of local residents (Alaska DCED 2004).

Hoonah, located south approximately 13 miles across Icy Strait from the Couverden project area, had an estimated population of 851 in 2003 and a total of 317 residents employed in 2000. Fishing, logging, and local government are the main employers. Sealaska Timber Corporation employs a number of local residents through contracts with Whitestone Logging, Inc. and Southeast Stevedoring. The Huna Totem Corporation owns and operates a sort yard and timber transfer facility (Alaska DCED 2004). Icy

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Straits Lumber and Milling, Inc. and D&L Woodworks, both located in Hoonah, are among the companies that could be interested in the proposed sale(s).

Haines, located approximately 60 miles north of the Couverden project area at the head of Lynn Canal, had an estimated population of 1,715 in 2003 and a total of 772 residents employed in 2000. Commercial fishing, tourism, timber, government, and transportation are the primary employers. Around 45,000 cruise ship passengers visit Haines each year (Alaska DCED 2004). Chilkoot Lumber in Haines is among the companies that could be interested in the proposed sale(s).

Juneau, located approximately 25 miles east of the Couverden project area, had an estimated population of 31,283 in 2003 and a total of 16,537 residents employed in 2000. The Juneau economy is primarily based on government, tourism, and support services for logging, fish processing, and mining. Juneau is the state capital and local, state, and federal agencies account for a large portion of total employment in the community. Tourism is also a significant part of the economy during the summer months, with over 690,000 cruise ship passengers and another 100,000 independent travelers visiting Juneau each year (Alaska DCED 2004). Silver Bay Logging, Inc. and W.R. Tongsgard Logging & Lumber in Juneau are among the companies that could be interested in the proposed sale(s).

Forest Products Employment

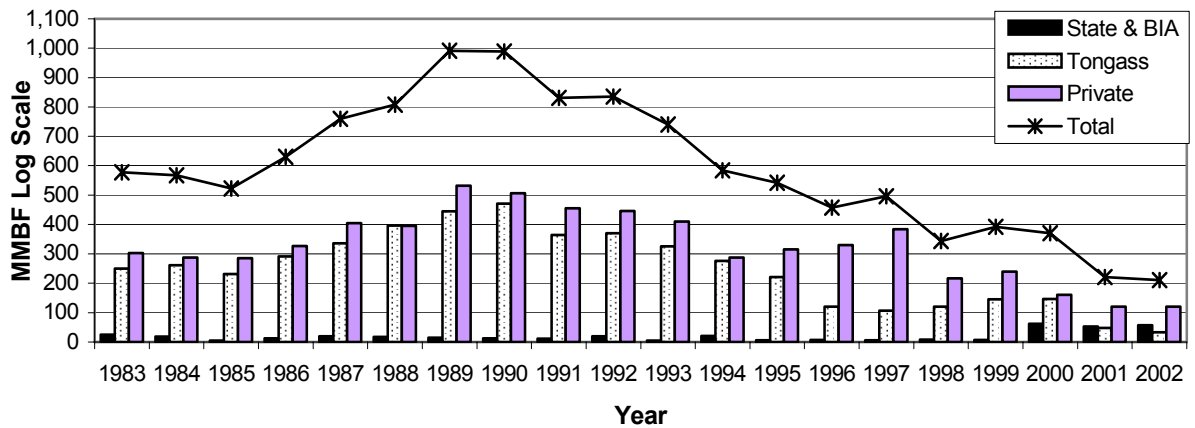
The Timber Industry

The Tongass National Forest has historically provided the majority of the timber processed in Southeast Alaska. Alaska Native Corporations and the state of Alaska have also occasionally participated in this market, but most sawlogs from these non-federal sources have historically been exported from the state without processing. While recent changes in overseas timber markets have resulted in Alaska Native Corporations and the state looking at potential domestic uses of their timber supply, these potential sources are not expected to significantly affect future demand for timber from the Tongass National Forest.

Annual Southeast Alaska timber harvest (by owner) is shown for 1983 through 2002 in Figure 3-4. Harvest levels ranged from peak levels of just under 1,000 million board feet (mmbf) in 1989 and 1990 to a low of 211 mmbf in 2002. Employment in the Southeast Alaska wood products sector has also declined significantly since the peak of 1990, decreasing by 2,761 jobs, or 78 percent, between 1990 and 2001 (USDA Forest Service 2003) (Figure 3-5). This decrease includes the direct loss of 899 pulp mill jobs due to the closure of the large pulp mills in Sitka (1994) and Ketchikan (1997), as well as a loss of 1,640 jobs in the logging sector, which reflects declines in both private and federal harvests. Employment decreases tend to lag behind decreases in production, and further declines in employment levels can be expected even if there are no further changes in harvest levels.

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Figure 3-4. Southeast Alaska Total Timber Harvests by Ownership, 1983-2002



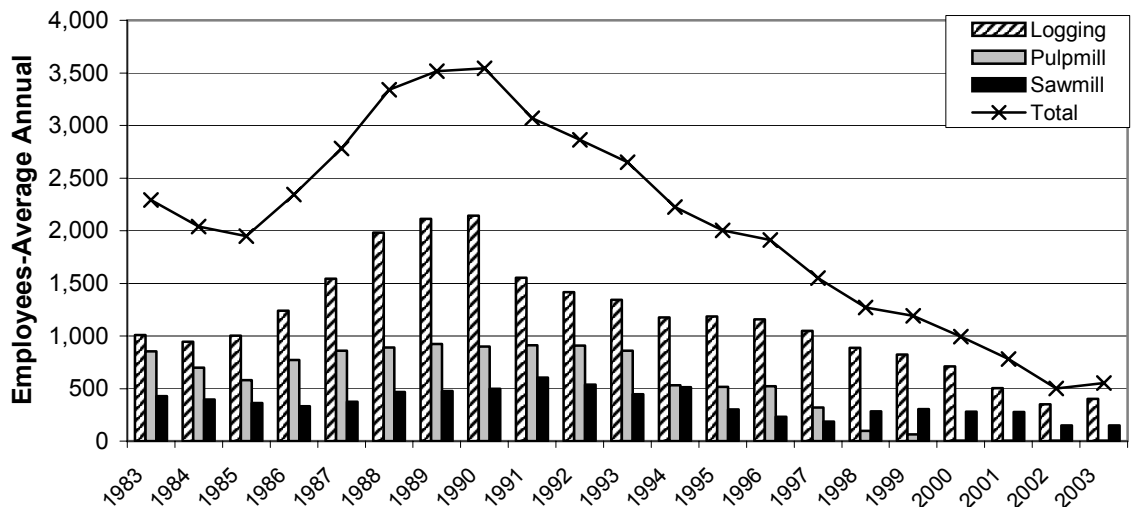
Notes:

1. Harvests from Alaska Mental Health Trust and University of Alaska lands omitted prior to 2000.

BIA = Bureau of Indian Affairs

Source: USDA Forest Service 2003; 2004

Figure 3-5. Southeast Alaska Timber Sector Direct Employment by Type, 1983-2003



Note:

Data for 1983 through 2001 are from USDA Forest Service, 2002. Data for 2002 and 2003 are from Alaska Department of Labor 2004.

Sources: USDA Forest Service 2003; Alaska Department of Labor 2004

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Data compiled by the Alaska Department of Labor (2004) suggest that average annual forest products employment declined between 2001 and 2002, with 150 people employed in wood products manufacturing and 350 employed in the logging sector in 2002. Data for 2003 indicate that wood products manufacturing employment remained constant, with average annual logging employment increasing to 400 jobs. Unadjusted Data for 2004 indicate that 150 people were employed in the wood products manufacturing sector, and logging employment ranged from 150 jobs in January to 400 during the peak season (Alaska Department of Labor 2005).

Employment in wood products manufacturing and logging accounted for approximately 2 percent of total regional non-farm wage and salary employment in Southeast Alaska in 2003 (Alaska Department of Labor 2004).

Timber Supply and Market Demand

Determining market demand is a complex process. Detailed explanations of the rationale for considering timber harvest in the Couverden project area and market demand for wood products are located in Appendix A of this document. More information can also be found in the Forest Plan FEIS, Part 1 (USDA Forest Service 1997b) to which this document is tiered.

The Tongass National Forest makes two determinations on volume to be offered. The first is a determination on volume to be offered for the current year (annual market demand). The annual market demand is analogous to assessing industry performance in the short term. In the short run, a firm will make use of its existing equipment to maximize profits or minimize losses. The general approach is to consider the timber requirements of the region's sawmills at different levels of operation and under different assumptions about market conditions and technical processing capability. These assumptions provide a basis for estimating the volume of timber likely to be processed by the industry as a whole in any given year. Timber inventory requirements are acknowledged and estimated in a related calculation. The volume of timber likely to be purchased is equal to the volume needed to make up any inventory shortfall in addition to the volume likely to be harvested in the coming year. The document, *Evaluating the Demand for Tongass Timber* (Morse 1998), forms the basis for how these estimates were developed. A second document, *Tongass National Forest Timber Sale Procedures* (Morse 2000a), describes the process used to determine the current fiscal year offer. The Regional Office updates actual estimates for each year. This estimate is what the Tongass plans to offer for the current year of the 10-year Timber Sale Schedule if sufficient funding is available. Final procedures can be located in *Responding to the Market Demand for Tongass Timber* (Morse 2000b).

Based on the analysis procedure documented in the *Tongass Timber Sale Procedures, Fiscal Year 2003*, the Tongass National Forest offering required to meet timber supply objectives is 151 mmbf. The offer planned will be a combination of new, previously offered, and previously offered and reconfigured timber sales. Both standing timber and salvage will be components of the program. Offerings will consist of those targeted for Small Business qualified firms, as well as a portion of the volume being made available for the open market.

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The second estimate the Tongass National Forest makes regarding determinations on volume to be offered is the long-term offer. The basis for this estimate is the long-range timber market projections documented in *Timber Products Output and Timber Harvest in Alaska: Projections for 1997-2010* (Brooks and Haynes 1997).

There are many variables that can increase the cost of timber sale offerings, and many may carry significant economic risks for potential purchasers. High cost could be incurred as a result of road construction, helicopter logging, the amount of timber volume, and the value of timber being removed. Market stumpage values must be sufficient to cover this cost and offer a profit for potential purchasers.

Economic deferral (deferring a timber sale for economic reasons) is dependent on changing conditions that include log prices, the cost of accessing harvest units (roads), and the efficiency of harvest systems (including yarding and hauling costs).

In order to maintain a stable timber sale program, the Forest Service needs to provide a continuous flow of timber to the timber industry and has developed a timber sale program to respond to this need. The proposed Couverden Timber Sale is a necessary component of this program, and the sale is identified on the 10-year Timber Sale Plan in the planning record.

Direct and Indirect Effects

Environmental Consequences

The following section is divided into three main parts. The first part presents projected employment and income by alternative, the second part discusses the effects of the alternatives in terms of payments to the state of Alaska, and the third part presents the results of the financial efficiency analysis conducted for this project.

Projected Employment and Income

The proposed Couverden Timber Sale would play a role in the overall Tongass National Forest sales program, helping to meet market demand for timber and retain existing employment levels. The proposed alternatives would generate between 24 and 143 job-years of direct employment and approximately \$1,084,000 and \$6,389,000 in direct income (Table 3-23). These employment and income impacts would not occur all in 1 year, and estimated job-years do not directly translate into numbers of affected workers. Job/harvest ratios and the average wood products income used in this analysis are from the Forest Plan FEIS (USDA Forest Service 1997b).

The job-year and income estimates presented in Table 3-23 are for logging and sawmill jobs only. They do not include indirect or induced employment and income impacts. Indirect impacts occur as a result of the logging and sawmill sectors purchasing inputs from other industries in the area. Induced impacts occur as a result of spending in the local economy from earnings created by the direct and indirect impacts. While it is likely that there would be indirect and induced impacts associated with the action alternatives, these types of impacts are difficult to accurately quantify. Indirect and induced impacts are not estimated here, but it is reasonable to assume that they would be generally proportional to the direct impacts, with the largest impacts occurring under Alternative 2.

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Table 3-23
Projected Employment and Income by Alternative

	Alternative					
	1	2	3	4	5	6
Projected Harvest Volume (CCF)	0	54,335	39,826	29,596	9,221	10,018
Projected Harvest Volume (mmbf)	0	27.4	19.9	14.9	5.0	6.4
Employment (job-years)						
Logging	0	53	39	29	9	10
Sawmills	0	90	66	49	15	17
Total	0	143	105	78	24	26
Income (\$1,000s)	0	6,389	4,683	3,480	1,084	1,178

Notes:

1. These employment estimates are based on a 6-inch utilization standard.
2. Job/harvest ratios and the average annual wood products income (\$44,542) used in this analysis are from the Forest Plan FEIS (USDA Forest Service 1997b). The job/harvest ratios are 0.000975 logging jobs/CCF and 0.001665 sawmill jobs/CCF.
3. Job-year estimates represent 1 year of logging or sawmill employment. This employment would not all occur in 1 year and estimated job-years do not directly translate into numbers of affected workers.
4. CCF = hundred cubic feet
5. The Forest Service's NEPA Economic Analysis Tool (NEAT) estimates volumes and values in CCF. For the purposes of analysis, there are assumed to be two CCF per thousand board feet (mbf) on the Tongass.
6. NEAT appraises income based partly on yellow cedar export rates; however, no cedar harvest is included in this proposal.

Payments to the State of Alaska

Prior to 2000, in states with national forests, 25 percent of the returns to the US Treasury from revenue producing Forest Service activities such as timber sales, were returned to each state for distribution back to counties (or in Alaska, boroughs) having acreage within a national forest. Those payments were called the "25 percent fund payments" and were dedicated by law to roads and schools. In October 2000, the *Secure Rural Schools and Community Self Determination Act of 2000* was enacted to stabilize federal payments to states, in response to declining federal receipts.

For fiscal years 2001 through 2006 under the new legislation, Alaska boroughs and communities have elected to receive a full payment amount rather than 25 percent of receipts. The full payment amount is the average of the highest three payments made to the state during the 14-year period between 1986 and 1999. These annual full payment amounts are primarily dedicated to roads and schools, with provisions for special project funding under certain conditions. Under the full payment approach, Forest Service payments to the state of Alaska during the 2001 to 2006 period would not be linked to annual Forest Service revenue, rather they would be based on the high 3-year historic average. The difference in revenues among the alternatives considered in this EIS would have no effect on the payments boroughs receive during the 2001 through 2006 time period. Payments made to the state of Alaska from 1986 through 2001 are shown in Table 3-24.

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Table 3-24
Payments to Alaska 1986 to 2001 (Amounts in \$1,000s)

Year	Payment (\$000s) ^{1/}
1986	745.6
1987 ^{2/}	0.0
1988	528.5
1989	6,266.0
1990	10,639.1
1991	10,791.2
1992	3,833.4
1993	4,406.4
1994	9,786.1
1995	8,230.8
1996	6,249.3
1997	1,252.1
1998	1,939.8
1999	2,086.6
2000	2,321.0
2001 ^{3/}	9,019.7

1/ Data are adjusted for inflation using the United States producer price index and are presented in 2000 dollars.

2/ Tongass receipts in Fiscal Year 1987 were negative due to Comptroller General Decision B-224730 of March 31, 1987, to retroactively implement the emergency rate redeterminations for short-term sales. Without this reduction, Tongass receipts would have been positive by \$2.1 million (unadjusted for inflation). As a result of the negative receipt, no payments were made to the state of Alaska that year.

3/ Represents legislated payment system as of October 2000.

Source: USDA Forest Service 2003.

Financial Efficiency Analysis

One way to compare the effects of the different alternatives is to conduct a financial efficiency analysis. Financial efficiency analysis compares the agency revenues and costs associated with each alternative and provides a consistent measure in dollars for comparison of alternatives. This differs from economic efficiency analysis, which takes a national accounting approach and seeks to measure all of the costs and benefits associated with a given alternative. Financial efficiency analysis only includes agency revenues and costs; it does not include non-market benefits, opportunity costs, individual values, or other values, benefits, and costs that are not easily quantifiable in monetary terms, such as recreation. The results of the financial efficiency analysis provide one tool that decision makers can use to help evaluate and compare alternatives.

Although individual timber harvest units may or may not be economical to harvest by themselves, the management of less productive land, or land containing a high percentage of defective timber, would help to increase future timber yields. The harvest of units with higher returns would help compensate for those less economical.

A preliminary financial appraisal was conducted for the action alternatives using the National Environmental Policy Act (NEPA) Economic Analysis Tool (NEAT). Harvest volumes were estimated only for sawlogs that would be harvested. Due to market conditions, utility logs are not currently required to be removed during harvest operations. No cedar harvest or export is

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included in this proposal. Volumes were calculated by the NEAT model based on project-specific field stand exam data.

NEAT is based on the Forest Service's Transactional Evidence Appraisal (TEA) system. The TEA system calculates the expected appraisal rate for a timber sale alternative based on the weighted average timber values and logging and road building costs from the last 10 timber sales sold, adjusting those values to account for differences between the weighted average and the proposed sale alternative. The value of the timber is calculated and then adjusted to account for logging and road costs. The current version of the model (1Q2004) calculates expected appraisal rates for the current and 11 preceding quarters. These market scenarios and the corresponding range of values are used to display the cyclical nature of timber markets. They are not intended to represent a final appraised stumpage value.

Before any National Forest timber is sold, it is appraised to estimate the material's fair market value. When a sale is offered, it is offered competitively and the contract is normally awarded to the firm offering the highest bid. These requirements have been imposed to help ensure that the government is justly compensated for any timber it sells. Estimated stumpage values were calculated for the Couverden Timber Sale action alternatives by including estimated stump to truck, transportation, logging overhead, and road construction costs. The stumpage values do not include bid premiums that could result from competitive bidding for the timber when sold.

The allowable sale quantity (ASQ) on the Tongass is partitioned into two portions referred to as non-interchangeable components (NICs) I and II. NIC I is volume scheduled from suitable lands that is harvested using existing logging systems, including tractor, shovel, standard cable, and helicopter yarding up to 0.75 mile. Most of these lands are expected to be economic to harvest under projected market conditions. NIC II is volume scheduled for harvest using logging or silvicultural systems not in common use in Southeast Alaska. Table 3-25 summarizes acres harvested by logging system and alternative for the proposed Couverden Timber Sale. The alternatives all fall within the definition of NIC I.

Table 3-25
Acres Harvested by Logging System and Alternative^{1/}

	Alternative^{2/}				
	2	3	4	5	6
Shovel, Clearcut with Reserves	33	20	81	0	6
Shovel, Selection Harvest	4	24	0	54	0
Short Span, Cable, Clearcut with Reserves	706	497	337	0	165
Short Span, Cable, Selection Harvest	116	190	0	285	0
Helicopter, Clearcut with Reserves	28	0	38	0	0
Helicopter, Selection Harvest	59	0	81	0	0
Total Acres	945	732	536	339	171

Note:

1/ The acres presented in this table differ from the unit totals because the totals in this table are for volstrata only and because GIS coverages vary slightly.

2/ Numbers are not exact due to rounding.

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Estimated harvest volumes, logging costs, and expected appraisal rates are presented by alternative in Table 3-26. The following analysis has been updated from the Draft EIS to reflect changes in market conditions. The analysis in the Draft EIS used the 3Q2002 version of the model. The analysis presented here uses the most recent version of the model (1Q2004), which incorporates March 2004 market conditions and data from the last 10 timber sales that preceded that date.

These estimates are based on March 2004 market conditions and assume an operator of average efficiency and a 6-inch utilization standard.

Estimated appraisal rates per hundred cubic feet (CCF) under current market conditions range from -\$83.48 under Alternative 4 to -\$8.25 under Alternative 6 (Table 3-26). These negative values primarily reflect current market values and stand composition, approximately 78 percent hemlock and 22 percent Sitka spruce under all alternatives. The March 2004 base prices used by NEAT for hemlock and Sitka spruce are -\$150.37 and \$149.96, respectively.

Projected logging costs range from \$103.05 per CCF under Alternative 6 to \$168.57 per CCF under Alternative 4. Logging costs are relatively low under Alternative 6 because this alternative does not include helicopter yarding, has a relatively short haul round-trip time, fewer road miles to maintain, and lower road construction and reconstruction costs. Logging costs are relatively high under Alternative 4, primarily due to the high costs associated with helicopter yarding under this alternative. Other logging costs under Alternative 4 include road maintenance and road construction and reconstruction costs, including the cost of reconstructing the Swanson Creek road. Logging costs for Alternative 5 are relatively high considering that the

Table 3-26
Timber Sale Values and Costs to an Operator of Average Efficiency (6-inch Utilization Standard)

	Alternative				
	2	3	4	5	6
Spruce Sawlogs (CCF) ^{1/}	11,941	8,755	6,580	2,065	2,193
Hemlock Sawlogs (CCF)	42,394	31,070	23,016	7,156	7,825
Total (CCF)	54,335	39,825	29,596	9,221	10,018
Total Road Costs (\$) ^{2/}	1,016,000	865,000	486,500	85,000	105,000
Logging Cost (\$/CCF) ^{3/}	124.28	124.33	168.57	134.72	103.05
Expected Appraisal Rate (\$/CCF) ^{4/5/}	-30.86	-33.71	-83.48	-59.18	-8.25
Expected Appraisal Total (\$) ^{6/}	-1,676,779	-1,342,501	-2,470,590	-545,699	-82,649

1/ The Forest Service's NEPA Economic Analysis Tool (NEAT) estimates volumes in CCF. For the purposes of analysis, there are assumed to be two CCF per thousand board feet (mbf) on the Tongass.

2/ Total road costs include both construction and reconstruction costs.

3/ Logging costs calculated by the NEAT model include stump-to-truck; haul, transfer, raft, and tow; road construction and maintenance; and unusual costs. Logging costs are one factor used to estimate potential appraisal rates.

4/ The estimated appraisal rate is calculated for each alternative based on project-specific characteristics. The estimated appraisal rates used in this analysis are based on the most recent data available from the NEAT model (March 2004).

5/ Base rates required to cover the costs of essential reforestation and a small return to the National Treasury would be the minimum rates advertised for sales appraised as deficit. Comprehensive bidding will determine the actual value.

6/ The expected appraisal total is calculated by multiplying total projected volume (CCF) by the expected appraisal rate (\$/CCF). Totals are not exact due to rounding.

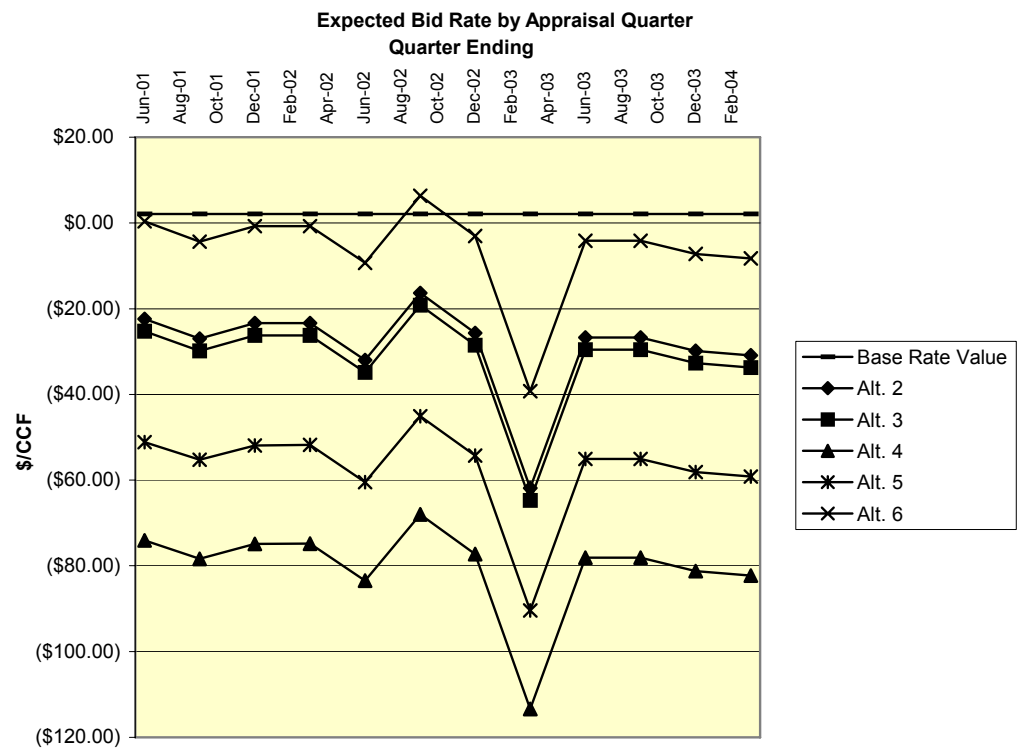
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selected units are located in close proximity to the existing road system. This is primarily because partial cut prescriptions would be applied to all of the units harvested under this alternative (see Table 3-25).

The estimated harvest volumes, expected values, costs to an operator, and net stumpage values presented in this document are not definitive figures. These estimates are useful for comparing the alternatives but should not be used for determining actual sale volume costs or values. Merchantable timber within units and any road right-of-way located on National Forest System (NFS) land will be cruised to determine the quantity, quality, and value of timber for the contract under which that volume of timber is offered. The final sale appraisal will include current quarter selling values, current cost information, and a normal profit and risk allowance to determine the minimum advertised stumpage value at the time of offering. Competitive bidding will determine the actual value. The sale would only occur if timber values rise to a level that would result in a positive appraisal.

Expected appraisal rates are displayed for each action alternative for the last 11 quarters in Figure 3-6. The basic curve followed by all five alternatives reflects the market conditions over the past 3 years. The bold black line

Figure 3-6. Expected Appraisal Rate by Quarter (6-inch Utilization Standard)



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near the top of the chart shows the base rate, the minimum rate the Forest Service will accept for timber. Expected appraisal rates below this line are not expected to sell under market conditions. Market prices may, however, vary enough to produce a positive sale in future years. Market swings could show numbers in the negative range today and still reach a positive stumpage value at time of sale.

Market prices can vary dramatically. There have, for example, been substantial changes in the base prices for hemlock and Sitka spruce over the past year. The March 2004 base period prices for hemlock and Sitka spruce used in the most recent version of the NEAT model were -\$150.37 and \$149.96, respectively. The most recent Region 10 Appraisal Bulletin (March 2005) identified respective base period prices of -\$80.28 and \$35.92 for hemlock and Sitka spruce (USDA Forest Service 2005).

Opportunities to Improve Economics

Different management standards could be applied to any alternative to improve the economics. Expected appraisal rates may, for example, be increased by appraising an alternative to a 10-inch utilization standard. Changing the utilization standard allows the purchaser to leave more small trees on site. Other management standards that improve the economics include not requiring the purchaser to remove utility logs. Both of these approaches reduce overall logging cost. Utility logs are currently not required to be removed during harvest operations due to market conditions. Use of the 10-inch standard in the analysis conducted for this project resulted in positive values under current conditions in 10 of the 11 preceding quarters for Alternative 6. Expected values were above -\$20 under March 2004 conditions and 10 of the 11 preceding quarters for Alternatives 2 and 3 (see Figure 3-7). Estimated harvest volumes, logging costs, and expected appraisal rates assuming a 10-inch utilization standard are summarized by alternative in Table 3-27.

Opportunities for Small Sales

The scoping process for the Couverden Timber Sale identified several public concerns related to timber sale economics. These included a concern that the range of alternatives include a sale for small operators that would benefit local communities. Alternative 5 is designed as a small sale program with sales in the 100 to 500 thousand board feet (mbf) range. The decision regarding the size of sales and how many sales to offer from a project is an administrative decision that is made on an annual basis after the Record of Decision is signed. The decision is based on the current market and the demand for timber. To facilitate the development of competitive markets, the Forest Service and the Small Business Administration agree on an annual set-aside goal for the Tongass National Forest (USDA Forest Service 1997b; p. 3-291). The most economical small-sale opportunities are located along the existing road system.

Higher volume sales, coupled with road construction, may be beyond the means of smaller timber purchasers, as may harvest using helicopter or large cable logging systems.

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Figure 3-7. Expected Appraisal Rate by Quarter (10-inch Utilization Standard)

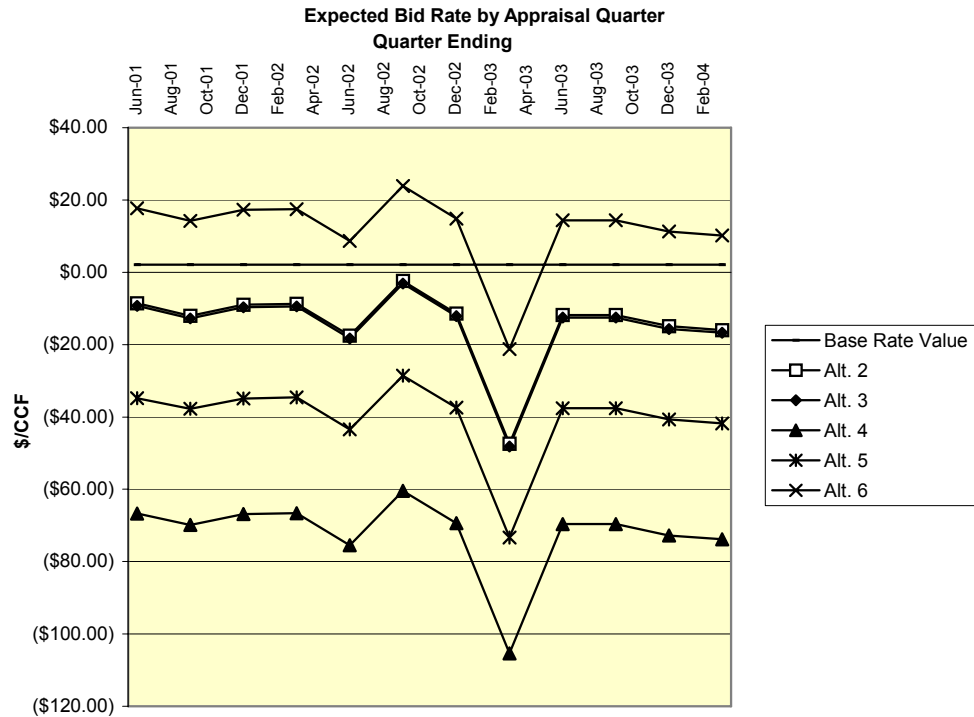


Table 3-27
Timber Sale Values and Costs to an Operator of Average Efficiency (10-inch Utilization Standard)

	Alternative				
	2	3	4	5	6
Total (CCF) ^{1/}	48,489	35,421	26,112	8,035	8,959
Total Road Costs (\$) ^{2/}	1,016,000	865,000	486,500	85,000	105,000
Logging Cost (\$/CCF) ^{3/}	124.01	122.19	175.86	133.64	98.95
Expected Appraisal Rate (\$/CCF) ^{4/, 5/}	-15.99	-16.71	-75.21	-41.75	10.22
Expected Appraisal Total (\$) ^{6/}	-775,339	-591,885	-1,963,954	-335,461	91,561

Notes:

- 1/ The Forest Service's NEPA Economic Analysis Tool (NEAT) estimates volumes and values in CCF. For the purposes of analysis, there are assumed to be two CCF per thousand feet (mbf) on the Tongass.
- 2/ Includes total road construction and reconstruction costs.
- 3/ Logging costs calculated by the NEAT model include stump-to-truck; haul, transfer, raft, and tow; road construction and maintenance; and unusual costs. Logging costs are one factor used to estimate potential bid values.
- 4/ The estimated appraisal value is calculated for each alternative based on project-specific characteristics. The estimated appraisal values used in this analysis are the most recent available values from the NEAT model (March 2004).
- 5/ Base rates required to cover the costs of essential reforestation and a small return to the National Treasury would be the minimum rates advertised for sales appraised as deficit. Comprehensive bidding will determine the actual value.
- 6/ The expected appraisal total is calculated by multiplying total projected volume (CCF) by the expected appraisal rate (\$/CCF). Totals are not exact due to rounding.

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Public Investment Analysis

Public investment analysis of each alternative compares the value of the timber with the cost of preparing the timber sale. The average Region 10 budget allocation costs and management expenses are subtracted from net stumpage revenues to determine net value. The costs and management expenses include environmental analysis, sale preparation, sale administration, and engineering support. Forest Service cost per hundred cubic feet (CCF) is based on the Region 10 average budget allocation of \$20.50/CCF for analysis, \$11.50/CCF for sale preparation, \$4.50/CCF for sale administration, and \$14.00/CCF for engineering support.

Environmental analysis costs include field inventory and the analysis of data, public involvement, and the preparation of a document that satisfies the requirements of NEPA. The timeframe is about 2 years and involves many resource specialists. The environmental analysis cost is constant and applies to all alternatives, including the no-action alternative.

Unit layout and cruising costs increase significantly when single tree selection and group selection is prescribed compared to clearcuts with reserves. The Alternatives-to-Clearcutting Research Study on Kupreanof Island found that it required approximately eight times the person days to prepare a unit that involved marking individual trees throughout the unit compared to a clearcut unit. Designation of 2-acre patches took about four times longer than a clearcut. Accessibility to the units is another major cost factor. Helicopter access and steeper terrain increase sale preparation costs compared to areas with existing road access.

Based on these factors, Alternative 6 would be the least costly alternative to administer because the majority of units that would be harvested under this alternative are located in close proximity to existing roads and would be clearcut. Alternative 4 would be relatively expensive on a unit basis (\$/CCF) because approximately 24 percent of the acres harvested under this alternative would be helicopter units and because of the high cost of reconstructing the Swanson Creek road. Alternative 5 would also be relatively expensive because single tree selection and group selection prescriptions would be applied to all of the units harvested under this alternative.

Sale administration costs are higher when helicopter logging is involved because of the increased cost of accessing the timber harvest for administration. Scattered and smaller harvest areas are more costly to visit. Because of the higher sale administration costs for helicopter yarding, Alternative 4 would have higher unit costs than the other action alternatives.

Cumulative Effects

The proposed timber sale is part of the Forest Service's timber sale program and is intended in combination with other past, present, and reasonably foreseeable timber sale projects in the region to provide a continued flow of timber to regional timber processors. The Tongass National Forest works on various timber sale projects simultaneously, resulting in a continual movement of projects through the stages of the timber program pipeline (analysis, sale, and under contract). Higher priority projects generally include sales, such as the Couverden Timber Sales, where investments

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such as road networks, camps, or log transfer facilities (LTFs) have already been established, and the project is not tied up in ongoing litigation.

No other timber sales are scheduled for the Couverden project area at this time. The Hobart project (scheduled for 2009-10) is the only other timber sale project identified for the Juneau Ranger District in the current Tongass 10-year Timber Sale Plan. This sale, if approved through the NEPA process, would harvest timber in the Hobart Bay area, approximately 60 to 65 miles to the southeast. The Tongass 10-year Timber Sale Plan lists several proposed sales on the Hoonah Ranger District, which is south of the project area on Chichagof Island. The Couverden project represents between 10 and 20 percent of the projected timber offerings on the two ranger districts for the next 10 years.

The size of the harvest and the type of sale offered would vary by alternative, affecting the portion of regional demand that would be met by the project. Alternatives 2, 3, and 4 would potentially supply larger volume as one-time sales that would be more likely to meet the needs of the larger operators in the region. Alternative 6 focuses on areas directly adjacent to the existing road system, and provides a lower volume than Alternatives 2, 3, and 4. Alternative 5 is designed as a small sale program with sales in the 100 to 500 mbf range and is more likely to meet the needs of smaller, local operators. There is also the opportunity with this project to provide one or more timber sales under the other action alternatives, depending on the alternative selected. The portions of regional demand that are not met through implementation of the selected alternative are likely to be met by sales elsewhere on the Forest.

The proposed project would affect the long-term timber supply in terms of the percent of available and suitable acres in the project area harvested. The percent of available acres harvested during this entry in the project area would vary by action alternative, ranging from 2 percent (Alternative 6) to 9 percent (Alternative 2) (Table 3-28). The percent of suitable acres that would be harvested during this entry in combination with previous entries would range from 12 percent (Alternative 1) to 20 percent (Alternative 2) (Table 3-28).

The proposed project would also affect the long-term supply of timber in terms of future entry into the project area. Road access is important to the economic feasibility of timber harvesting and alternatives with more road construction provide more opportunities for future economical harvest operations (using conventional yarding techniques). Alternative 2, followed by Alternatives 3 and 4, has the most miles of permanent roads, and, therefore, a greater potential for future contributions to the economic supply of timber in the next entry.

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Table 3-28
Projected Harvest as a Percentage of Suitable and Available Acres in the Project Area

Timber Harvest (acres)	Alternative					
	1	2	3	4	5	6
Suitable Acres	12,291	12,291	12,291	12,291	12,291	12,291
Harvested Acres ^{1/}	1,467	1,467	1,467	1,467	1,467	1,467
Mature Forest Acres Suitable for Harvest	10,824	10,824	10,824	10,824	10,824	10,824
Treatment Acres	0	978	759	566	367	172
Total Acres Treated	1,467	2,445	2,226	2,033	1,834	1,639
Percent of Available Acres Treated This Entry	0%	9%	7%	5%	3%	2%
Cumulative Percent of Suitable Acres Treated	12%	20%	18%	17%	15%	13%

1/ This represents the number of suitable acres in the project area that have been harvested. Harvest has occurred in other locations in the project area, but these areas are not considered suitable under the current Forest Plan.

Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

Issue 4: Harvests Systems

The range of silvicultural methods used to harvest timber in the proposed project was a key issue raised during the public scoping. Members of the public and representatives from other agencies suggested that alternatives to clearcutting, such as selection silvicultural systems including diameter limit harvest methods, be considered. Some believed that these harvest systems would better mimic natural disturbance patterns. This section addresses these concerns. Additional details on silviculture and timber can be found in the Timber Resource Report (Foster Wheeler Environmental 2003e).

Forest Ecology and Disturbance

Three commercial tree species are common in the project area. They are western hemlock, mountain hemlock, and Sitka spruce. Yellow-cedar is present as an occasional tree. Each species forms plant communities or plant associations with other trees, shrubs, and forbs. The climax plant community is the result of the interaction between landform, climate, soils, and disturbance history.

The predominant agent of natural disturbance in the project area is wind. It occurs in two-forms: small-scale and large-scale. The rooting habits of western hemlock and Sitka spruce make these species susceptible to windthrow; both species are shallow rooted and depend on mutual support for wind resistance. Scattered windthrow of large overmature trees is a prime cause of mortality. It creates small openings in which the advance growth in the understory may develop. Wind events capable of causing this type of blowdown occur regularly, usually in the fall or winter. Factors influencing blowdown potential are aspect, topography, existing blowdown (history), stand density (stocking), and other factors (defect, tree height, etc.). The result of windthrow on the forest landscape is a mosaic of stands of different ages and types. Traits of windfirm stands, as well as stands susceptible to windthrow, are summarized in the Timber Resource Report (Foster Wheeler Environmental 2003e).

The tools that are available for use in maintaining natural disturbance processes at the stand level are discussed in the Forest Plan FEIS, Appendix G (1997b). This appendix lists three groupings of silvicultural systems (or ways of managing forests for clearly defined goals). They are even-age, two-age, and uneven-age systems. A combination of these silvicultural systems were prescribed for the action alternatives: even-age, two-age, and uneven-age management systems. These systems mimic different severities of the natural disturbances that occur in this area.

Silvicultural Treatments

Silvicultural systems are planned processes used to tend, harvest, and re-established forest stands. Treatments are applied throughout the life of the stand for the purpose of reaching a desired condition. Treatments include the harvest or regeneration of the stand, intermediate cuttings, and other cultural treatments necessary for the replacement and development of the

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forest stand. No single silvicultural system can produce all desired combinations of products and amenities from a particular stand or project area. A prescription is a written record that includes treatments prescribed for the stand. Silvicultural systems can produce even-aged, two-aged, or uneven-aged stands. By using a combination of systems in the project area, biological diversity can be maintained on a landscape basis.

Even-aged Systems

Even-age systems produce stands that consist of trees of the same or nearly the same age. Clearcutting and clearcutting with reserves are the most commonly used methods in Southeast Alaska to achieve even-aged results. Even-aged systems produce distinct successional stages and there are even-aged stands of various ages and size classes distributed throughout the managed forest. Even-aged forests have relatively low vertical diversity but a high degree of horizontal diversity as the forest is a mosaic of forest and opening. The low vertical diversity is a result of the comparatively simple structure of the even-aged stand. To increase the vertical diversity, all clearcuts prescribed in the action alternatives have included specifications for leaving reserve trees. Clearcutting with reserve trees can be used to maintain a mixture of stand development stages on a landscape scale and for logging practicality.

Clearcutting with Reserves

Clearcutting involves the removal of virtually the entire stand in one cutting. The objective of this method is to create a fast-growing, even-aged stand of trees to maximize wood fiber production. In the narrowest sense, the cutting operation includes the removal of all standing woody vegetation. A variant of this method includes retaining non-merchantable trees and other reserve trees where operationally feasible within the harvest unit. The reserve trees are generally distributed throughout the harvest areas in groups and clumps; the location is dependant upon the yarding system used. Reserve trees are also located along the edges of units or along stream buffers to feather the edges and improve the remaining stand or stream buffer windfirmness.

Clearcuts with reserves are expected to regenerate naturally to full stocking with a mixture of hemlock and Sitka spruce, as have other stands in the project area. Establishment of natural regeneration in harvested units within the Couverden project area is expected to take up to 5 years. It is expected to take 10 to 15 years for the harvest units to appear to be regenerated from a distance due to the longer snow season and shorter growing season in this area, especially in higher elevations. As the stand canopy closes, precommercial thinning can be used to distribute the stocking and species evenly across the stand. Precommercial thinning can also be used to delay the closure of the canopy and improve deer forage, if necessary. The remaining trees would then grow and, unless commercially thinned, maintain a closed canopy throughout a majority of the rotation of the stand, which is expected to be 100 to 150 years on most sites. Thinning the stand to improve growth on the remaining trees or as an intermediate harvest would open the canopy for a period of time, probably several years. Reserve trees would remain in the stand throughout the rotation.

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The clearcuts with reserves regeneration method is recommended for some of the units under all of the action alternatives except Alternative 5 (refer to unit prescriptions in Appendix B). When used, clearcutting with reserves is selected on a unit specific basis in the following situations: where units are visually screened and/or sized appropriately to the Visual Quality Objective (VQO) of the area; where soils and slopes would not be adversely affected by use of the prescription; and where the prescription was appropriate to meet or not unduly affect, wildlife, watershed, and other resource values specific to the unit being considered. Unit specific justifications for harvesting methods can be found in the unit cards (Appendix B). The use of clearcutting minimizes the risk that the leave trees will blowdown, improves regeneration productivity, and optimizes harvesting economics. Table 3-29 shows the acres harvested and the silvicultural system used by alternative.

Two-age Systems

Two-age systems produce stands that contain two-age classes for most of the rotation. The two-age system can take the form of clearcuts with retention (if sufficient trees are left) or diameter limit harvest. The resulting stand may be two-aged or tend towards uneven-aged conditions as a consequence of both an extended period of regeneration establishment, and the retention of reserve trees that may represent two or more age classes. The overwood trees provide structural diversity and a biological legacy.

Uneven-age Systems

Uneven-age silvicultural systems produce stands of much greater structural diversity than even-aged systems. The diversity is due to the numerous age classes, tree distribution, and, generally, the presence of a greater number of species within the stand. The system maintains multiple age classes and species singly, in small groups, patches, or strips. The uneven-age system can take the form of individual tree selection, diameter cuts, and group-selection cuttings. These methods of cutting will create stands with trees of varying ages and sizes over time.

Table 3-29
Silvicultural System by Alternative

	Acres Harvested				
	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
Even-age	801	537	554	0	172
Two-age/uneven-age	177	222	12	367	0
Percent two-age uneven-age	18	29	2	100	0

Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

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Diameter Limits—The diameter based harvest prescription is used in varying degrees in all of the action alternatives except Alternative 5 (Appendix B). This designation method is applied to achieve a form of group selection where the group of trees being retained is described as a diameter class rather than a spatial pattern of openings. This type of harvest consists of retaining all trees under a specified diameter (most commonly 17 inches at diameter at breast height [dbh]) along with at least 5 trees per acre larger than 20 inches dbh. It is used with an uphill cable or helicopter yarding system. The intent of this prescription is to leave trees distributed fairly evenly across the units. Over time, areas harvested with this prescription may develop into uneven-aged stands with a range of age and size classes from seedlings to large trees. If only smaller trees were left, the resulting stand would resemble a two-aged stand. By also leaving large trees, a wider range of age and size classes would be retained.

Group Selection—Group selection prescriptions are prescribed for downhill cable logging settings where partial retention was required to meet VQOs or where uneven-aged management is required. The design of the spatial shape and orientation of these group selections or patch cuts is based upon the logging system. For the Couverden project area, prescriptions calling for the removal of group selection are designed to allow downhill cable yarding of 2-acre strips or patches while maintaining the remainder of the stand undisturbed. The result would be a stand that mimics many characteristics of stands that develop in areas where small-scale blowdown predominates.

The stands treated using a two-aged or uneven-age silvicultural system would have a higher level of structural diversity than those treated with even-aged systems. The residual stand would allow enough sunlight to the understory to allow younger seedlings to become established. Shade tolerant species, such as western hemlock, would be favored, though larger openings would allow Sitka spruce to regenerate and grow. This prescription would allow harvest to occur on visible slopes within the Scenic Viewshed in a way that meets long-term visual quality management objectives while providing wood products. Two-aged and uneven-age management would reduce the long-term production of wood fiber compared to even-age management. It also allows harvest of timber in areas that would otherwise be difficult or impossible to manage with even-age management and meet forest plan standards and guidelines.

Two-age and Uneven-age Prescriptions

Direct and Indirect Effects

Alternatives 2 and 3 would include a mix of even-age and two-age/uneven-age management prescriptions. Alternative 4 would use primarily even-age management; only one unit would have a two-age prescription. The two-age and uneven-age management areas in these three alternatives would generally be located in the Scenic Viewshed Land Use Designation (LUD). Alternative 5 would harvest all units using a two-age and uneven-age management system. Under Alternative 6, all would have an even-aged management prescription to maximize economic return from a timber sale program.

Cumulative Effects

Past activities resulted in the harvest of approximately 2,463 acres (2,164 acres of productive forest), with the first harvest occurring in 1979. Approximately 342 mmbf existed prior to harvest on land currently considered suitable. Approximately 46.2 mmbf has been harvested from these suitable areas. An even-flow, long-term sustained yield analysis for the project area, assuming a 100-year rotation for the Timber Management LUD and a 170-year rotation for the Scenic Viewshed LUD and including all past and proposed harvest, concluded that a sustained harvest of 9 percent of the suitable volume per decade is sustainable. Alternative 2, which has the highest harvest volume of 27.4 mmbf, would harvest less than 9 percent.

All past harvest used even-age management (clearcutting). Precommercial thinning in some older harvest units was completed in 2004. No other timber harvests are planned in the project area in the foreseeable future, including state and private land. Whether or not any of the over selected land will be transferred to the Huna Totem Corporation and how it would be managed if transferred is not foreseeable at this time. Cumulative harvest by management type is listed in Table 3-30 for each alternative.

Table 3-30
Cumulative Harvest (acres)

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
Even-age	2,463	3,264	3,000	3,017	2,463	2,635
Two-aged/ uneven-age	0	177	222	12	367	0

Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

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Issue 5: Scenery

Introduction

The National Forest System (NFS) and National Park System lands on the southern Chilkat Peninsula are well known for the pristine and natural appearance of mountain and marine landscapes. Recreation opportunities in this area attract residents and tourists alike. Landscapes in this region are visible from a major public travel route, Icy Strait, which is also a part of the Alaska Marine Highway. Changes to these landscapes from past and proposed timber harvest are a key issue raised by the public during scoping. This section evaluates the effects of the proposed timber sale on the scenery resources in the project area. Refer to the Scenery Resource Report for more information on the scenery resources (Foster Wheeler Environmental 2003f).

Affected Environment

The project area landscape is classified in the Coast Range Visual Character Type. Landforms in this Visual Character Type are generally large and give an impression of great bulk. In the project area, uplands are generally 3,000 to 4,000 feet in elevation dissected by deep steep-walled U-shaped valleys. Mountain ridges are generally rounded summits. The large saltwater fiords protruding into this character type are sometimes extremely steep-sided, affording great visual relief because of the abrupt differences in elevation. A great variety of geologic features are exhibited within this character type. Shorelines vary from rocky bluffs to sand beaches. A great variety of vegetation exists in the Coast Range Visual Character Type ranging from the marshes and tidal meadows, to conifer covered slopes, to deciduous tree cover in the upper river drainages (USDA Forest Service 1979).

Between 1979 to 1992, timber harvest occurred on approximately 2,463 acres in the project area. Most of the harvested acres are located between the Homeshore and Swanson Creek drainages. This harvested land has had between 10 and 25 years to revegetate, and some areas currently meet a Modification or Partial Retention Visual Quality Objective (VQO). The past timber harvest is evident from Icy Strait (Figure 3-8). The road network constructed for the past harvest activities is typically not visible from the saltwater.

Existing Visual Condition

The majority of the project area, approximately 61 percent, has an Existing Visual Condition (EVC) I, which is a natural landscape that has remained unaltered by human activity. EVC I includes part of Roadless Area #304. Most of the roaded portion of the project area was inventoried with an EVC III, accounting for approximately 31 percent of the project area. Land altered by the Homeshore II timber sale (harvested between 1989 and 1992) was categorized with an EVC IV or EVC V. Approximately 1 percent of the project area has an EVC IV, mostly in the Homeshore II timber sale area. Land in EVC V accounts for approximately 6 percent of the project area. Land rated with an EVC V is located in places of past timber harvest activity. Table 3-31 presents the total acres for each EVC category.

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Figure 3-8. Timber Harvest in the Project Area as Seen from Icy Strait



Table 3-31

Existing Visual Condition Ratings of the Project Area (Acres)

EVC	Acres of National Forest System Land
1	27,273
3	13,863
4	620
5	2,677
Unclassified	114
Total FS Acres in Project Area	44,547

Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

Variety Class

Variety Class is a measure of the landscape diversity of an area. There are three Variety Classes, including:

- ♦ **Type A.** Possesses landscape diversity unique or distinctive for the character type.
- ♦ **Type B.** Possesses landscape diversity common for the character type.
- ♦ **Type C.** Possesses a low level of landscape diversity

Most of the land within the project area is in Variety Class B (76 percent), a setting common for the Visual Character Type. The entire coastline (to about

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1 mile inland) and the islands are in Variety Class A, which have distinctive landscape features. Land in Variety Class A covers approximately 5 percent of the project area. Substantial pockets of Variety Class C, landscapes with minimal variety, are also located in the project area. Approximately 19 percent of the project area is categorized as Variety Class C.

Visual Priority Travel Routes and Visible Areas

Visual Priority Travel Routes (VPR)/use areas and visually sensitive areas were identified using the 1997 Forest Plan. The Forest Plan identifies the following VPRs and priority use areas:

- ♦ Icy Strait—a part of the Alaska Marine Highway, a tour ship and a small boat route.
- ♦ Homeshore Bay (the 4 miles along the coast near the log transfer facility [LTF])—a saltwater use area.
- ♦ Couverden Island and surrounding islands (from No Use Ledge to Point Howard)—a saltwater use area and dispersed recreation area.
- ♦ Couverden Island—a boat anchorage and small boat route.
- ♦ Ansley Island—a boat anchorage and small boat route.

Land Use Designations

Desired future conditions for visual quality are guided by management prescriptions in the 1997 Forest Plan. All land in the forest is assigned to a Land Use Designation (LUD), which has specific adopted VQOs. Adopted VQOs define the degree to which the natural landscape can be altered to meet the desired conditions. Commercial timber harvest is not permitted in the Old-growth Habitat and Semi-remote Recreation LUDs.

Four LUDs were assigned in the project area. They include Timber Production, Scenic Viewshed, Semi-remote Recreation, and Old-growth Habitat. The VQOs for each LUD differ depending upon the distance from VPRs. The Forest Plan adopted VQOs for each LUD are shown in Table 3-32.

Approximately 53 percent of the NFS land in the project area is assigned the Timber Production LUD. The Timber Production LUD is located in the higher elevations, set back from the coastline. This LUD includes suitable timber

Table 3-32
Visual Quality Objectives in Each Distance Zone by Land Use Designation

LUD	Distance Zone			
	Foreground	Middleground	Background	Not Seen
Timber Production	Modification	Maximum Modification	Maximum Modification	Maximum Modification
Scenic Viewshed	Retention	Partial Retention	Partial Retention	Maximum Modification
Semi-remote Recreation	Partial Retention	Partial Retention	Partial Retention	Partial Retention
Old-growth Habitat	Retention	Retention	Retention	Retention

Source: USDA Forest Service 1997a.

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lands that contribute to the forest-wide sustained timber yield and have a balanced mix of age classes. Portions of the land allocated to the Timber Production LUD in the project area are not suitable for harvest, including the muskegs and the low-volume forest. Management activities may be evident in most seen areas in this LUD, including road construction. The acceptable VQOs are Modification and Maximum Modification.

The Scenic Viewshed LUD is located along most of the project area coastline, around the private land, and around the Old-growth Habitat reserve in the east. Scenic Viewshed LUD is allocated to approximately 22 percent of the project area. A natural-appearing landscape is expected in this LUD in areas seen by forest visitors and recreationists using popular travel routes and use areas in the project area, such as east Icy Strait and Couverden Island. VQOs acceptable in this LUD range from retention to maximum modification, depending on the distance from VPRs (Table 3-32).

Approximately 19 percent of the project area is allocated to Semi-remote Recreation LUD. This LUD includes land in the east and northeast parts of the project area. Land assigned to the Semi-remote Recreation LUD is characterized by a mostly unmodified natural environment. Moderate degrees of remoteness and solitude are desired in this LUD; therefore, a Partial Retention VQO is expected.

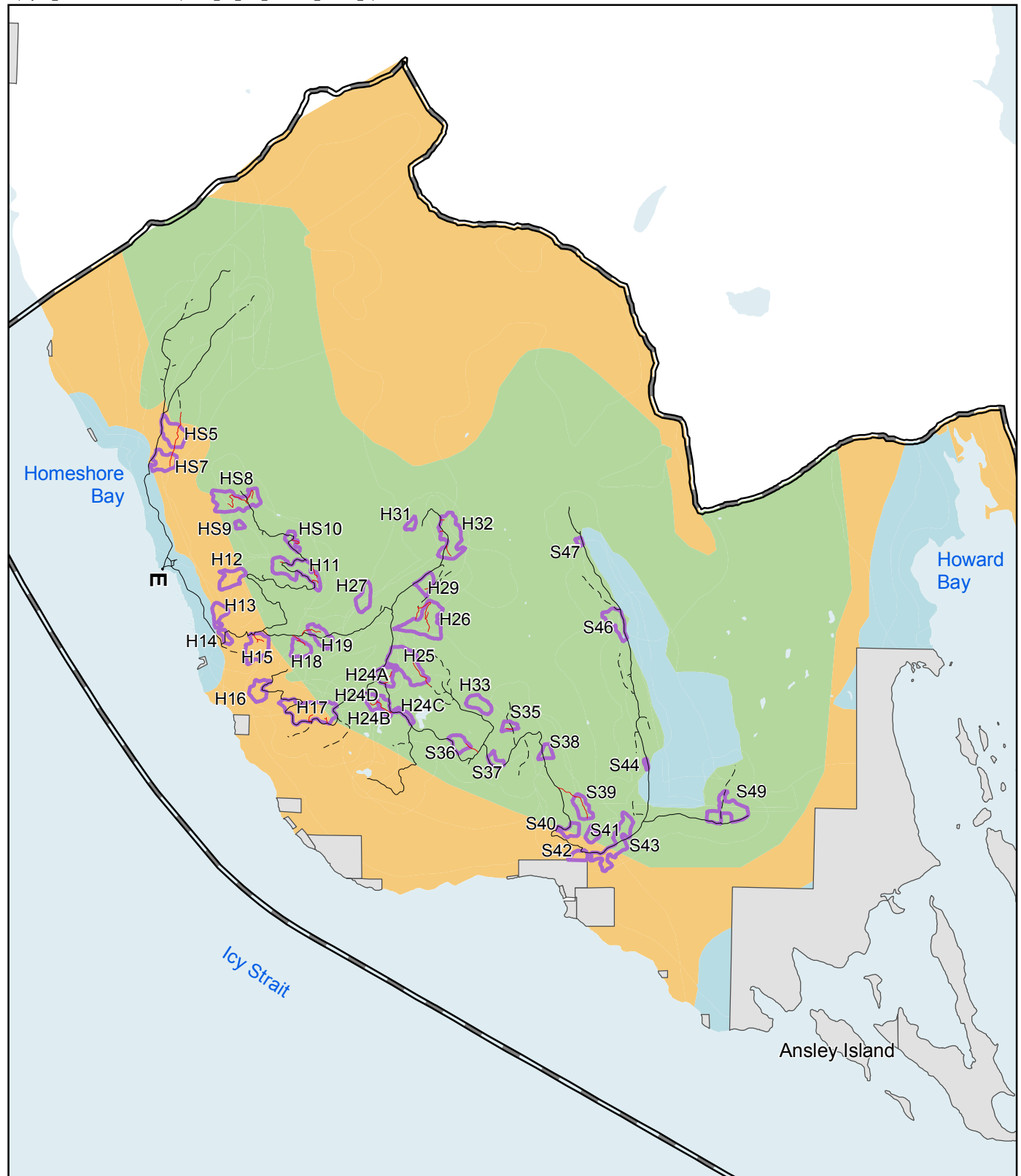
Approximately 6 percent of the project area (in two locations) is allocated to the Old-growth Habitat LUD. Land in this LUD is typically preserved for flora and fauna species associated with old-growth forests. The Retention VQO for this LUD reflects this desire for a natural setting.

Visual Quality Objectives

Three VQOs are present in the project area: Retention, Partial Retention, and Maximum Modification. The project area VQOs are shown in Figure 3-9. The goal of these VQOs are as follows:

- ♦ *Retention*—A VQO that provides for management activities that are not visually evident to the casual observer.
- ♦ *Partial Retention*—A VQO in which management activities are to remain visually subordinate to the natural landscape.
- ♦ *Maximum Modification*—A VQO that prescribes that an area may be dominated by management activities, but the resulting visual characteristics should appear as natural occurrences when viewed from the background distance zone.

Over half of the NFS land in the project area has a Maximum Modification VQO (Table 3-33). Approximately 38 percent of the project area has a Partial Retention VQO, which is mostly along the coastline. The remainder of the project area has a Retention VQO, located in the Old-growth Habitat LUD, along the southern coast, and along the west coast near Homeshore Bay. The adopted VQOs are met in most of the project area, but they are not met in all areas because of past harvest. Additional activities must meet the VQO.



Legend

- LTF - Log Transfer Facility
- Proposed Road
- Existing Classified Road
- Former Temporary Road
- Unit Pool (Unit# H33)
- Water Body
- Non-NFS Land

- VQO (adopted)
- Maximum Modification
- Partial Retention
- Retention
- Project Boundary

Figure 3-9
Adopted Visual Quality
Objectives (VQO)



0 0.5 1 2
Miles

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Table 3-33
Acres of National Forest System Land in the Project Area by Visual Quality Objectives

	VQO			Total National Forest System Acres
	Maximum Modification	Partial Retention	Retention	
National Forest System Acres	23,553	17,153	3,841	44,547
Percent of Total	53%	38%	9%	100%

Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

Visual Absorption Capability

The Visual Absorption Capability (VAC) rating is typically derived from the landscape complexity, slope, and distance from the viewing area (distance zone). The VAC rating helps to determine the difficulty and design required to achieve the project area's VQOs and range from high, intermediate, to low. The combination of the VAC and the VQO help shape harvest unit parameters. Harvest unit design considers topography, visual sensitivity, and the desired condition of the landscape, as documented in the Forest Plan.

A high VAC can absorb the greatest amount of alteration without compromising the landscape integrity. With mitigation measures in places with intermediate and low VACs, the management activity should maintain the landscape integrity. Approximately 85 percent of the project area has an intermediate VAC. Land with a high VAC is in 15 percent of the project area and is concentrated around the coastline and in Homeshore Creek. Less than 1 percent of the project area has a low VAC and is located in the southern project area.

Key Viewing Areas

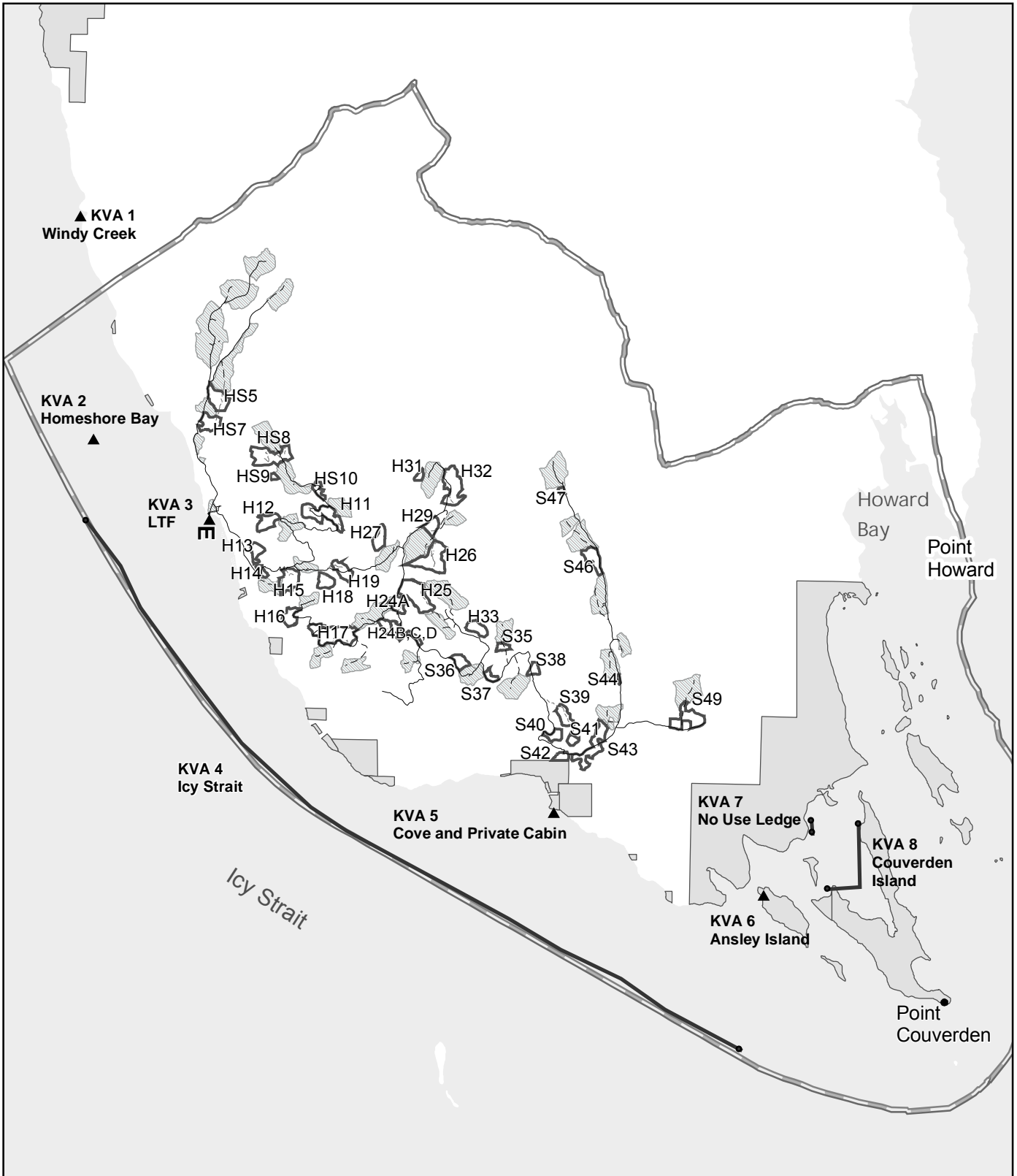
To analyze the effects timber harvest could have on scenic quality, eight viewpoints were selected to represent the sensitive viewing areas throughout the project area (Figure 3-10). These viewpoints represent the most popular recreation areas and travel corridors. They also represent the views that would be seen by the greatest number of people in the project area vicinity. The Key Viewing Area (KVA) locations were guided by the Forest designated VPR and use areas. The effect analysis for each alternative will focus on the KVA viewshed.

KVA 1—Windy Creek

KVA 1 is located along the shoreline near Windy Creek, just north of the project area. This KVA represents coastal views from the inventoried dispersed recreation site and the charter fishing boats that frequent this area. This KVA is included in the analysis because it is a popular location.

KVA 2—Homeshore Bay

KVA 2 is located in Homeshore Bay, which is along the northwestern coastline of the project area. This area attracts charter boats and users with fishing and beach recreation interests. The coastal views of this KVA include two



Legend

- LTF - Log Transfer Facility
- Point of Interest
- KVA
- KVA
- Proposed Road
- Existing Classified Road
- Former Temporary Road

- Unit Pool (Unit# H33)
- Project Boundary
- Previous Harvest
- Non-NFS Land

Figure 3-10
Key Viewing Areas



0 0.5 1 2
Miles

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converging drainages in the middleground and snow-clad peaks in the background. Older harvest units are visible in the foreground. While these older units are still visible, there has been substantial regrowth of trees over the last 20 years.

KVA 3—Log Transfer Facility

KVA 3 is located along the western coast at the entrance to the LTF. This area is a popular anchorage and access point for recreation or subsistence use. Most views from this point are of the beach and the forested coastline. Views looking north include peaks in the background.

KVA 4—East Icy Strait

KVA 4 is a section of the Icy Strait visual priority travel route located along the western side of the project area. Icy Strait is a small boat route, a saltwater use area, and a part of the Alaska Marine Highway. This viewpoint enjoys a broad landscape scene across the western side of the project area. Past timber harvest is noticeable along this route in the foreground and middleground. The background boasts snow-clad peaks that dominate most of this view.

KVA 5—Private Cabin

KVA 5 is an area with two private recreation residences along the southern coast. Views from this area are mostly of the beach area and forested hills in the middleground. Note: There are also two recreation cabins between KVA5 and KVA6.

KVA 6—Ansley Island

KVA 6 represents Ansley Island, a visual priority route and use area. Ansley Island is an anchorage and small boat route. The coastal views from this area include Couverden Island, the forested coast, and the snow-capped mountains in the background.

KVA 7—No Use Ledge

KVA 7 is located at No Use Ledge, a visual priority use area. Saltwater use and dispersed recreation take place in this area. The coastal views from No Use Ledge include Couverden Island, the forested coast, and the snow-capped mountains in the background.

KVA 8—Couverden Island

KVA 8 is located at Couverden Island, a visual priority route and use area. Couverden Island is a boat anchorage, small boat route, saltwater use area, and a dispersed recreation area. The coastal views from this area include Couverden Island, the forested coast, and the snow-capped mountains in the background.

Environmental Effects

Unit Design

All harvest units in all of the proposed alternatives were designed to meet the adopted VQOs and achieve the desired future visual condition. Some of the proposed units are in areas visible from the surrounding VPRs, KVAs, or other popular use areas in which the casual forest visitor could notice the harvest activity. All of the proposed units would be located at least 0.5 mile from the closest edge of a VPR or use area. The visible units would meet the relevant VQO using special harvest prescriptions or specific mitigation techniques.

Land Use Designation and Visual Quality Objective

Most of the proposed harvest units are on land allocated to the Timber Production LUD and have a Maximum Modification VQO. The remaining units are in the Scenic Viewshed LUD and have a partial retention VQO. Land with Retention VQO is within the project area near Homeshore Bay. No proposed harvest units, however, are within areas with the Retention VQO. The

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boundary of the Old-growth Reserve LUD would be modified under all action alternatives to provide additional high-volume old growth and to exclude areas within 300 feet of a road in the central portion of the project area. As in other areas with the retention VQO, no proposed harvest units are in this LUD.

Every effort was made to meet or exceed the adopted VQOs during the planning phase of this project. This was accomplished by using mitigation techniques, such as concentrating retention trees in the visible portion of harvest units; leaving all trees 16 inches dbh or smaller (in some cases 20 inches dbh or smaller) and at least 5 trees per acre over 20 inches diameter at breast height (dbh) in single tree selection and group selection units; siting clearcut with reserves units in areas not seen or minimally seen from VPRs or other important use areas; and using group and individual selection harvest techniques. Helicopter harvest was proposed in some alternatives to avoid the visual impacts caused by road construction. To further screen roads, retention trees would be left below roads, where possible. The location of the mitigation would vary for each unit, based on the VAC(s) for each unit. A detailed prescription for each unit is included in Appendix B.

All of the alternatives propose to harvest less than 35 acres in land classified in EVC 1. One exception is Alternative 5, which does not propose timber harvest in areas with EVC 1. Most of the proposed harvested acreage in each of the alternatives (87 to 96 percent) are within EVC 3.

Visual Absorption Capability

A combination of the project area VAC and adopted VQOs shape the harvest unit design parameters as described under Affected Environment. Between 67 and 90 percent of the harvest units have an Intermediate VAC (Table 3-34), depending on the alternative. Based on the VAC analysis, most of the area within the proposed units would tolerate a moderate amount of landscape disturbance and keep a natural appearing landscape, as seen from surrounding VPRs. The harvest techniques previously described would mitigate the visual impacts in areas with intermediate VAC. Reserving trees in visible areas with intermediate VAC would take precedence over areas with a high VAC, where possible. In addition, harvesting to a 10-inch top rather than a 6-inch top in order to improve sale economics would result in more smaller trees being left in units. Between 10 and 33 percent of the proposed harvest units have a high VAC, depending on the alternative. None of the proposed units have a low VAC.

Table 3-34
Percent of VAC in the Proposed Units by Alternative

	Alternative				
	2	3	4	5	6
Low	0%	0%	0%	0%	0%
Intermediate	75%	73%	90%	67%	67%
High	25%	27%	10%	33%	33%

Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

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Key Viewing Areas

Out of the eight selected KVAs for this project area, six KVAs had at least one proposed unit in the viewshed. More of the project area can be viewed from East Icy Strait (KVA 4) than any other KVA. No land within the project area is visible from KVA 1. Views from Windy Creek (KVA 1) and No Use Ledge (KVA 7) would not include any of the proposed harvest units.

General Effects of Alternatives on Scenic Quality

All of the proposed action alternatives include mitigation techniques to meet and exceed the VQOs in harvest areas and roaded areas visible from VPRs. Each alternative's response to maintaining the current visual integrity of the landscape is, therefore, measured by the amount of land proposed for harvest or roading in visible areas and the overall change from current conditions.

Alternative 1 (No Action)

No timber harvest would take place under this alternative. No change in scenic quality would occur under Alternative 1. Trees in areas of past timber harvest in the project area would continue to grow and harvested areas would progress towards a more natural landscape.

Alternative 2

Alternative 2 proposes to harvest the most acres (978 acres). Approximately 446 acres within the proposed harvest units would be visible from the selected KVAs. Alternative 2 would impact the current scenic integrity the most out of the proposed action alternatives, although the harvest prescription for each unit was designed to meet the VQOs. The most noticeable alteration would be in the Homeshore and Swanson Creek drainages.

Most of the land within the proposed units (approximately 75 percent) has an intermediate VAC. The remaining 25 percent has a high VAC. The respective Retention, Partial Retention, and Maximum Modification VQOs would be met in all of the harvest units. Harvest units closest to the coastline and in the Swanson and Humpy drainages would employ selective harvest to meet the Partial Retention VQO. In most cases, all trees 16 inches dbh and smaller and at least 5 trees per acre more than 20 inches dbh would be left in the harvest units. In cases where logging feasibility would not facilitate this prescription, portions of the visible area would be left uncut (Appendix B).

Alternative 2 would implement a clearcut with reserves harvest prescription on more acres than the other action alternatives, primarily because more units in the unseen areas are proposed. The units would meet the respective VQOs when seen from surrounding saltwater viewing areas. Alternative 2 would also construct more miles of road than the other alternatives. Road construction in Alternative 2 includes visual screening techniques, such as feathering and leaving reserved trees below the road to screen the road from saltwater and other use areas. Some of the proposed road construction would enter roadless and unroaded areas. All of the roads would be closed after timber harvest. Helicopter logging is also proposed in five units to reduce the cost and visual impacts of road construction.

Under Alternative 2, the estimated change in EVC would be from EVC 3 to EVC 4 in the Homeshore and Swanson Creek drainages (Table 3-35). Roughly 6 percent of the project area would change from EVC 3 to 4. Although visual mitigation would be implemented in this alternative, EVC classification considers the condition of the landscape. Therefore, proximity to past timber harvest factors into the EVC change.

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Table 3-35
Estimated Percent Change in EVC by Alternative (percent of project area)^{1/}

EVC	Alternative				
	2	3	4	5	6
1	-	-	-	-	-
2	-	-	-	-	-
3	(6%)	(6%)	(3%)	-	(< 1%)
4	6%	6%	3%	-	< 1%
5	-	-	-	-	-
6	-	-	-	-	-

^{1/} Numbers in parenthesis are negative.

Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

Alternative 3, Proposed Action

Alternative 3 is more responsive to maintaining the scenic integrity than Alternative 2, although it is second only to Alternative 2 in the amount of area harvested.

Approximately 759 acres would be harvested under this alternative. Approximately 313 acres in the proposed harvest units are visible from the selected KVAs. Most of the acres proposed for harvest would be clearcut with reserves (74 percent), but would meet the VQOs through mitigation efforts, such as feathering and concentrating reserve trees in areas visible from VPRs and other use areas. Selection harvest (as described under Alternative 2) is proposed for six units to mitigate the visual impacts of timber harvest as viewed from saltwater. No harvest is proposed in roadless or unroaded areas. Most of the proposed units have an intermediate VAC (73 percent). The remaining 27 percent of the units have a high VAC. Most of the timber harvest units are located similarly to Alternative 2, except that under Alternative 3 many of these units are smaller, which helps maintain the scenic quality.

This alternative proposes the second most miles of road construction, but less classified roads would be built than under Alternative 2. Under Alternative 3, no road construction would occur in roadless or unroaded areas. This alternative also includes visual screening techniques for roads, such as leaving trees below the road to screen the road. All of the roads would be closed after timber harvest. No helicopter logging is proposed in this alternative.

The estimated EVC change under this alternative is similar to Alternative 2, with roughly 6 percent of the project area changing from EVC 3 to EVC 4 (Table 3-35). Although visual mitigation would be implemented in this alternative, EVC classification considers the condition of the landscape, so proximity to past timber harvest factors into the EVC change."

Alternative 4

Alternative 4 is more responsive to maintaining the scenic integrity than Alternative 2 or Alternative 3. Approximately 566 acres would be harvested under this alternative. Approximately 84 acres in the proposed harvest units would be visible from the selected KVAs. No unroaded or roadless areas would be harvested. Most of the timber harvest units would be hidden from the surrounding VPRs. Approximately 90 percent of land in the proposed

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harvest units has an intermediate VAC. The remaining 10 percent of land in this alternative has a high VAC.

Over 85 percent of the units in this alternative would be clearcut with reserves. These units would meet the respective VQOs. The timber harvest activity is concentrated in the Humpy and Swanson Creek drainages. The most noticeable alteration would be in this part of the landscape. Selective harvest (as described under Alternative 2) and helicopter harvest is proposed for some units to mitigate the visual impacts of timber harvest from surrounding saltwater. Only roads less than 0.5 mile long would be constructed under this alternative. No road construction would enter roadless or unroaded areas. All of the roads would be closed after timber harvest.

Under Alternative 4, roughly 3 percent of the project area would change from EVC 3 to 4 (Table 3-35). Visual mitigation would be implemented in this alternative. EVC classification, however, considers the condition of the landscape, so proximity to past timber harvest factors into the EVC change.

Alternative 5

Alternative 5 is very responsive to the goal of maintaining the scenic integrity of the area. Approximately 367 acres would be harvested in this alternative. While approximately 77 acres in the proposed harvest units would be visible from the selected KVAs, timber harvest would be limited to the area within 500 feet of existing open system roads, and all units would be selectively harvested.

No road construction is proposed under this alternative. Between the small unit size and the single tree selection and group selection prescription, this alternative would be visually unobtrusive in the landscape. The areas with the most visual impact are 0.5 mile to 2 miles inland from the coastline and would retain the existing scenic quality through the single tree selection and group selection method.

The implementation of Alternative 5 would not result in a change in EVC within the project area. Because the harvest units in this alternative are comparably small and would employ the partial cut prescription, there would be no change to the visual condition in the project area.

Alternative 6

Alternative 6 is also very responsive to the goal of maintaining current scenic quality. This alternative would harvest approximately 172 acres. Approximately 34 acres of the harvest units are in visible areas from the selected KVAs. The units would be seen primarily as a background from east Icy Strait. The harvest activity would be outside of the Homeshore and Swanson Creek drainages. All of the four proposed units would be clearcut with reserves. To mitigate the visual effects of the timber harvest and to meet the VQOs, the reserve trees would be concentrated in the visible areas. Only short segments of road would be constructed under Alternative 6. All of the roads would be closed after timber harvest. No helicopter logging is proposed in this alternative.

Alternative 6 would not result in a significant change in EVC within the project area. A comparably small area (about 178 acres) near the west coast may change from EVC 3 to EVC 4. This change, however, would effect less than 1 percent of the project area. Visual mitigation would be implemented in this

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alternative. EVC classification considers the condition of the landscape and proximity to past timber harvest for a change in EVC.

Effects of Alternatives on Scenic Quality from Selected KVAs

This section describes in more detail what the effects of each alternative would be on the scenery observed from each selected viewpoint. The proposed actions for the KVAs that are inventoried VPRs or use areas are simulated using photographs taken during the field work.

KVA 1—Windy Creek

None of the action alternatives propose harvest units visible from KVA 1.

KVA 2—Homeshore Bay

The views from Homeshore Bay would be most affected by Alternative 2, with 144 total acres visible in eight proposed harvest units. The visible units are in the western and southern viewing area from KVA 2. Most of the visible acres under Alternative 2 would employ single tree selection and group selection. Trees 16 inches dbh and smaller plus 5 trees per acre over 20 inches dbh would generally be left to meet the partial retention VQO (Appendix B). The remaining acres would be clearcut with reserves (Table 3-36). Most of these clearcut units would be in the southern viewing area of Homeshore Bay. The potential effects of harvesting units HS 5, HS 7, and HS 8 on the view from Homeshore Bay (looking east towards Homeshore Creek) under Alternative 2 are illustrated in Figures 3-11 and 3-12.

Table 3-36

KVA 2—Homeshore Bay: Acres Harvested in Seen Area by Alternative

Unit	Acres of Unit in Seen Area – By Alternative				
	2	3	4	5	6
HS5	35	27	-	5	-
HS7	18	13	-	1	-
HS8	38	-	-	1	-
H12	14	2	-	-	-
H13	9	-	-	-	-
H14	5	5	-	5	-
H16	1	1	-	1	1
H17	24	24	-	9	-
Total Clearcut with Reserves Acres in Seen Area	64	1	-	-	1
Total Selection Harvest Acres in Seen Area	80	71	-	22	-
Total Acres Harvested in Seen Area	144	72	-	22	1

Notes:

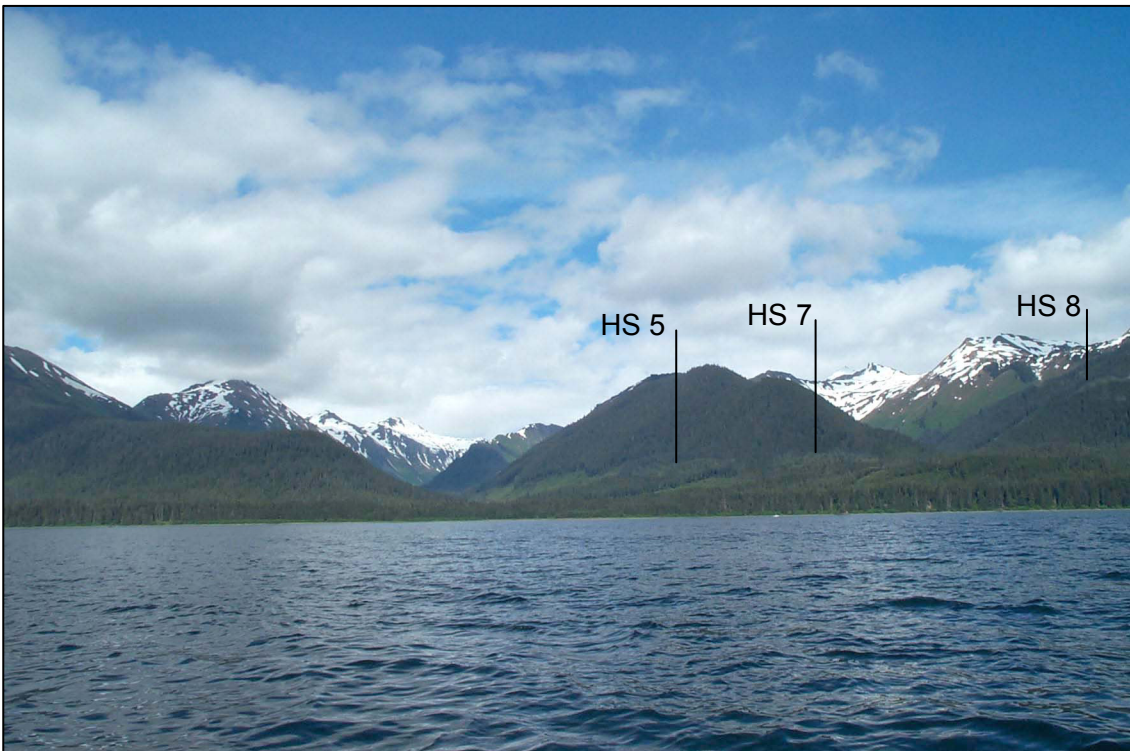
1. The clearcut with reserves prescription has 10 percent retention.
2. The single tree selection and group selection prescription includes diameter limits and patch cuts.
3. Four additional harvest units had areas less than 0.5 acre visible from KVA 2.
4. Total "seen" area that may not be contiguous within the proposed harvest unit.
5. Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

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Figure 3-11. View of Homeshore Creek Looking East from KVA 2, as of June 2002



Figure 3-12. View of Homeshore Creek Looking East from KVA 2 after the Timber Harvest Proposed under Alternative 2; Observed during the First 10-year Regrowth Cycle



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Alternatives 3 and 5 also propose harvesting units that would be noticeable from Homeshore Bay. One acre is visible under Alternative 6. Disturbance, however, would not be noticeable from KVA 2. In both Alternatives 3 and 5, the single tree selection and group selection prescription as described above would be applied to the visible units (except for 1 acre in Alternative 3). These effects are illustrated in Figures 3-13 and 3-14. The appropriate VQOs would be met by all of the alternatives.

KVA 3—Log Transfer Facility

Alternative 2 would affect the view from KVA 3 the most because 15 acres would be visible (Table 3-37); however, due to the use of a single tree selection and group selection system, harvest would not be noticeable. Each visible unit would meet the appropriate VQO. Most of the visible area in this alternative would be selectively harvested (13 acres). Trees 16 inches dbh and smaller plus 5 trees per acre over 20 inches dbh would generally be left to meet the Partial Retention VQO (Appendix B). The remaining visible acres would be clearcut with reserves (2 acres).

Alternatives 3 and 5 would have a small amount of acres visible from the LTF in the proposed harvest units. The timber harvest in these visible areas would not be noticeable from this KVA because of the small seen area (less than 5 acres). Alternatives 4 and 6 do not propose harvest units visible from KVA 3.

KVA 4—East Icy Strait

The action alternatives would affect the East Icy Strait viewshed the most out of all the selected KVAs, ranging from 423 visible acres in Alternative 2 to 33 acres in Alternative 6. The views from KVA 4 would be most affected under Alternative 2, with 423 total acres visible in 20 proposed harvest units. The visible units are mostly located along the western coastline of the project area. Most of the visible acres from Alternative 2 would be clearcut with reserves

Table 3-37
KVA 3—Log Transfer Facility: Acres Harvested in Seen Area by Alternative

Unit	Acres of Unit in Seen Area – By Alternative				
	2	3	4	5	6
H11	2	2	-	1	-
H12	11	2	-	-	-
H13	2	-	-	-	-
Total Clearcut with Reserves Acres in Seen Area	2	2	-	-	-
Total Selection Harvest in Seen Area	13	2	-	1	-
Total Acres Harvested in Seen Area	15	4	0	1	0

Notes:

1. The clearcut with reserves prescription has 10 percent retention.
2. The single tree selection and group selection prescription includes diameter limit harvest.
3. One additional harvest unit had an area less than 0.5 acre visible from KVA 3.
4. Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

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Figure 3-13. View of Homeshore Creek Looking East from KVA 2 after the Timber Harvest Proposed under Alternative 3; Observed during the First 10-year Regrowth Cycle

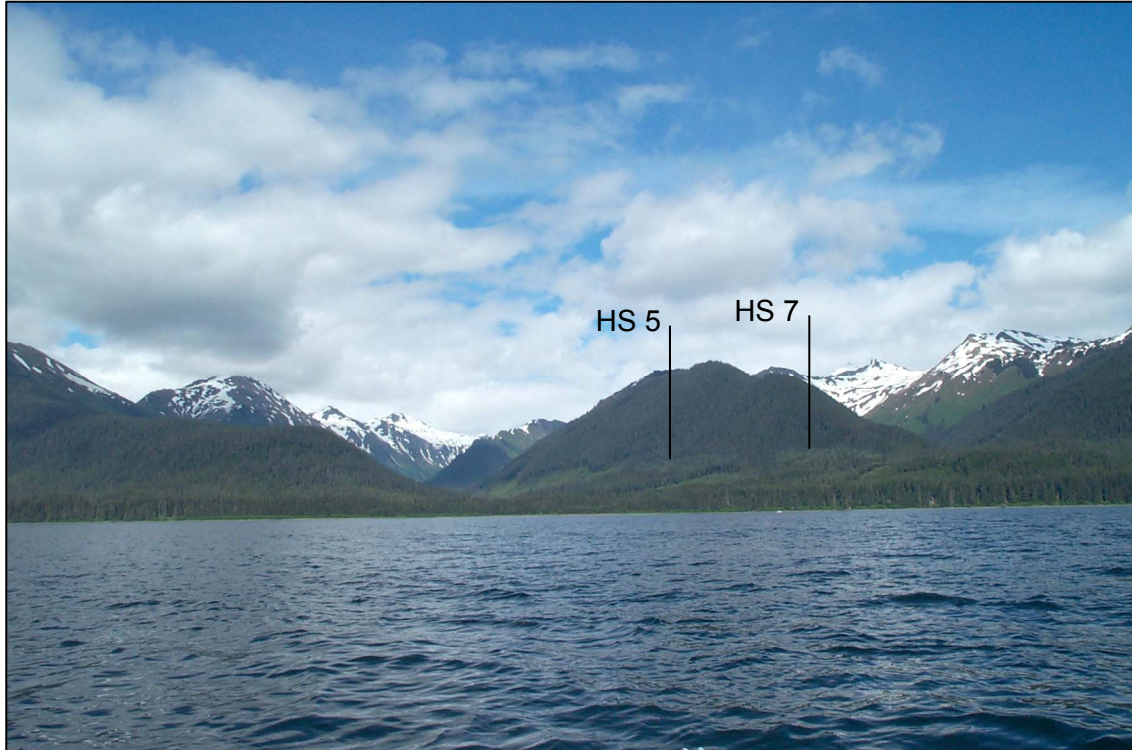
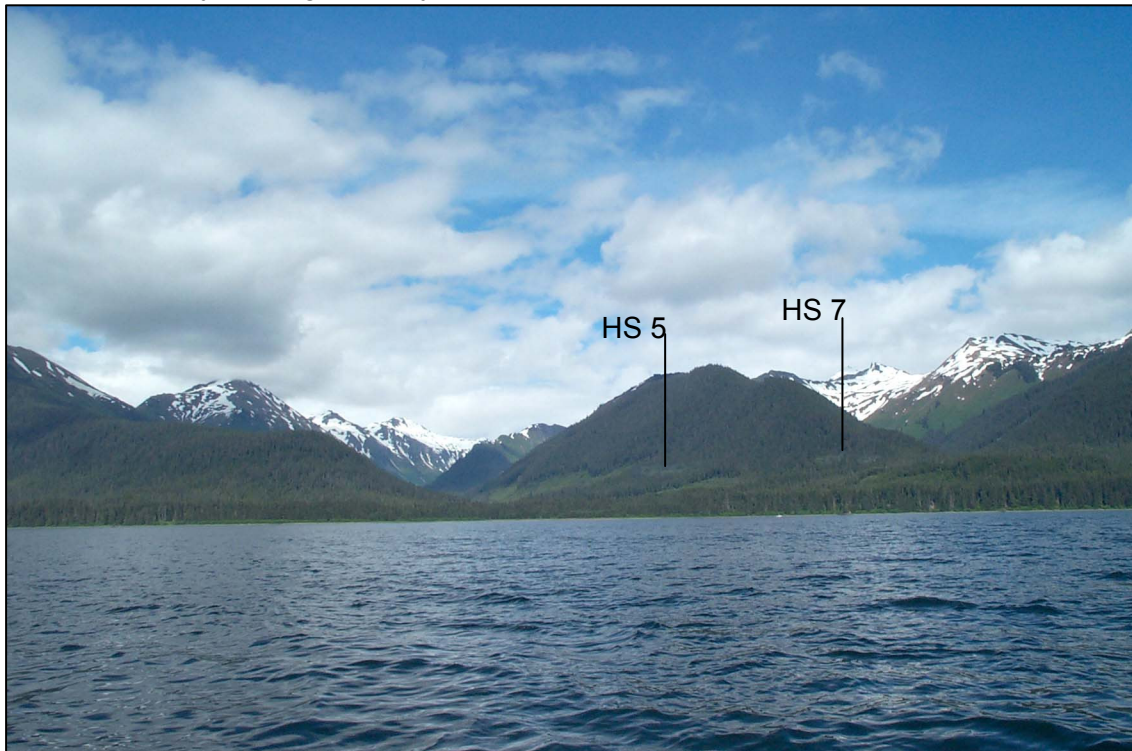


Figure 3-14. View of Homeshore Creek Looking East from KVA 2 after the Timber Harvest Proposed under Alternative 5; Observed during the First 10-year Regrowth Cycle



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(308 acres) (Table 3-38). The respective Maximum Modification or Partial Retention VQOs would be met in these units. The remaining visible acres would employ single tree selection and group selection. Trees 16 inches dbh and smaller plus 5 trees per acre over 20 inches dbh would generally be left to meet the Partial Retention VQO, if applicable (Appendix B).

Table 3-38

KVA 4—East Icy Strait: Acres Harvested in Seen Area by Alternative

Unit	Acres of Unit in Seen Area – By Alternative				
	2	3	4	5	6
HS5	27	20	-	3	-
HS7	15	12	-	1	-
HS8	51	-	-	8	-
HS9	2	-	2	-	-
HS10	2	2	2	1	-
H11	33	33	-	26	-
H12	23	7	-	-	-
H13	20	-	-	-	-
H14	9	9	-	9	-
H15	21	21	-	1	21
H16	12	12	-	2	12
H17	55	55	-	8	-
H18	4	4	2	-	-
H19	13	13	-	1	-
H24A	4	4	4	2	-
H24B	5	5	5	-	-
H25	50	18	29	-	-
H26	53	29	5	-	-
H33	-	-	8	-	-
S35	3	3	3	-	-
S37	-	-	-	1	-
S39	21	12	-	-	-
S40	-	10	-	1	-
S41	-	-	5	-	-
S42	-	9	-	1	-
S43	-	-	5	3	-
S49	-	-	1	1	-
Total Clearcut with Reserves Acres in Seen Area	308	166	66	-	33
Total Selection Harvest in Seen Area	115	112	5	69	-
Total Acres Harvested in Seen Area	423	278	71	69	33

Notes:

1. The clearcut with reserves prescription has 10 percent retention.
2. The single tree selection and group selection prescription includes diameter limits and patch cuts.
3. One additional harvest unit had an area less than 0.5 acre visible from KVA 4.
4. Total seen area that may not be contiguous within the proposed harvest unit.
5. Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

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Figures 3-15 and 3-16 illustrate the potential effects of Alternative 2 on the view from the north portion of East Icy Strait looking east towards the project area. Units seen from this area of the route would be H14, HS10, H11, H15, H16, and H26, although the harvest activities may not be noticeable.

Alternatives 3, 4, 5, and 6 also propose harvesting units that would be noticeable from East Icy Strait, but to a lesser degree than Alternative 2 (Figures 3-17, 3-18, 3-19, and 3-20). Under Alternative 3, approximately 278 acres would be visible (166 acres of this would be clearcut with reserves and 112 would be selection harvest). Alternatives 4, 5, and 6 have much less area visible from KVA 4 in the proposed units, as noted in Table 3-38. In all of the alternatives, mitigation measures such as selecting harvesting or feathering would be used to meet the adopted VQO and to lessen the visual impact of the harvest on the views from KVA 4.

KVA 5—Private Cabin

Alternatives 3 and 5 would have a small amount of area visible from the private cabin in the proposed harvest units (Table 3-39). Any effects from this KVA would not be noticeable because of the small area changes visible from this KVA (less than 5 acres). Alternative 3 would have the most acres of proposed harvest units visible from the private cabin. Approximately 4 acres would be visible in two units. These 4 acres would be clearcut with reserves and would meet the respective VQO. Alternatives 2, 4, and 6 do not include units visible from KVA 5.

KVA 6—Ansley Island

Alternatives 3, 4, and 5 would have a small amount of area visible from Ansley Island in the proposed harvest units (Table 3-40). Any adverse visual effects from this KVA would not be noticeable because the visible area is small (5 acres or less). Alternative 3 would have the most acres of proposed harvest units visible from Ansley Island. Approximately 5 acres would be visible in one unit. These 5 acres would be clearcut with reserves. Alternatives 2 and 6 do not include units visible from KVA 6.

Table 3-39

KVA 5—Private Cabin: Acres Harvested in Seen Area by Alternative

Unit	Acres of Unit in Seen Area – By Alternative				
	2	3	4	5	6
S39	-	1	-	-	-
S40	-	3	-	1	-
Total Clearcut with Reserves Acres in Seen Area	-	4	-	-	-
Total Selection Harvest in Seen Area	-	-	-	1	-
Total Acres Harvested in Seen Area	-	4	-	1	-

Notes:

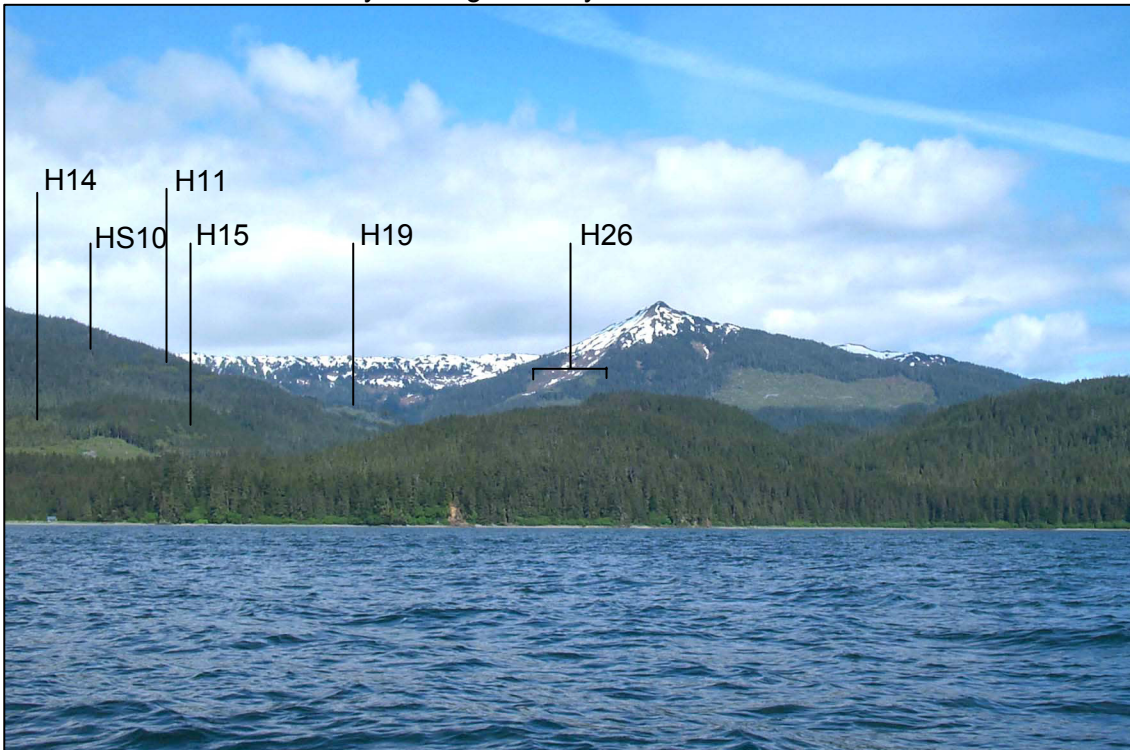
1. The clearcut with reserves prescription has 10 percent retention.
2. The single tree selection and group selection prescription includes diameter limits and patch cuts.
3. Total seen area that may not be contiguous within the proposed harvest unit.
4. Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

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Figure 3-15. View of the Project Area Looking East from the Northern Part of KVA 4, as of June 2002



Figure 3-16. View of the Project Area Looking East from the Northern Part of KVA 4 after the Timber Harvest Proposed under Alternative 2; Observed during the First 10-year Regrowth Cycle



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Figure 3-17. View of the Project Area Looking East from the Northern Part of KVA 4 after the Timber Harvest Proposed under Alternative 3; Observed during the First 10-year Regrowth Cycle

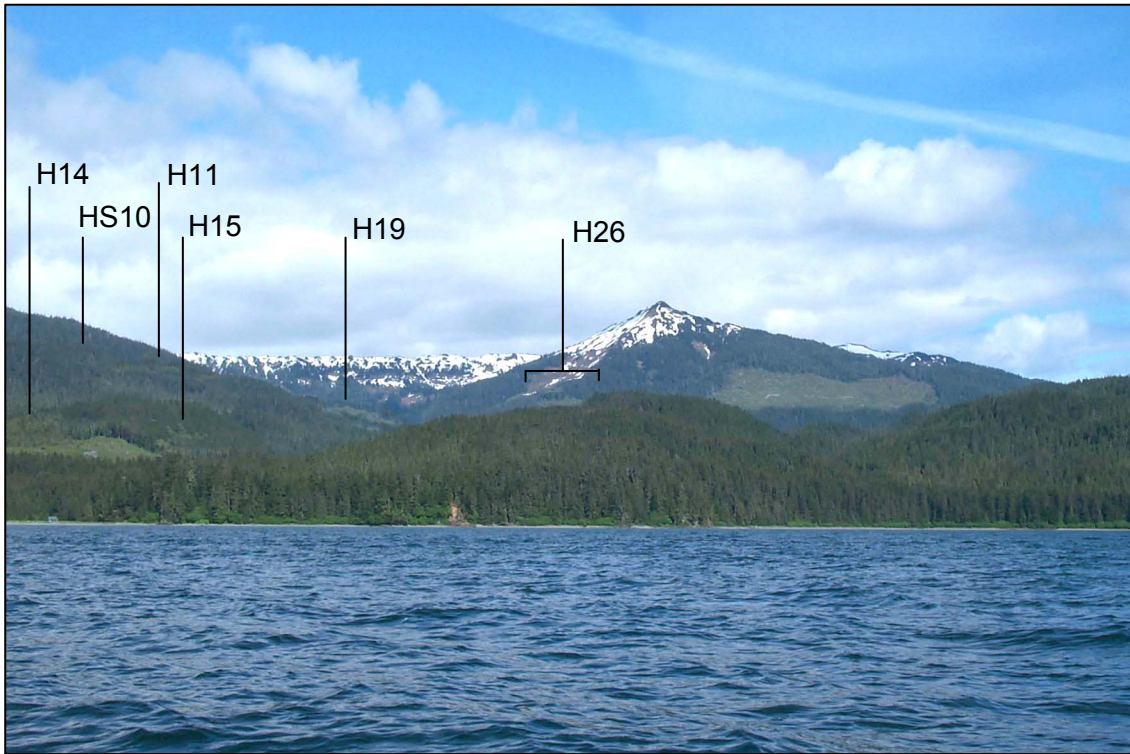


Figure 3-18. View of the Project Area Looking East from the Northern Part of KVA 4 after the Timber Harvest Proposed under Alternative 4; Observed during the First 10-year Regrowth Cycle

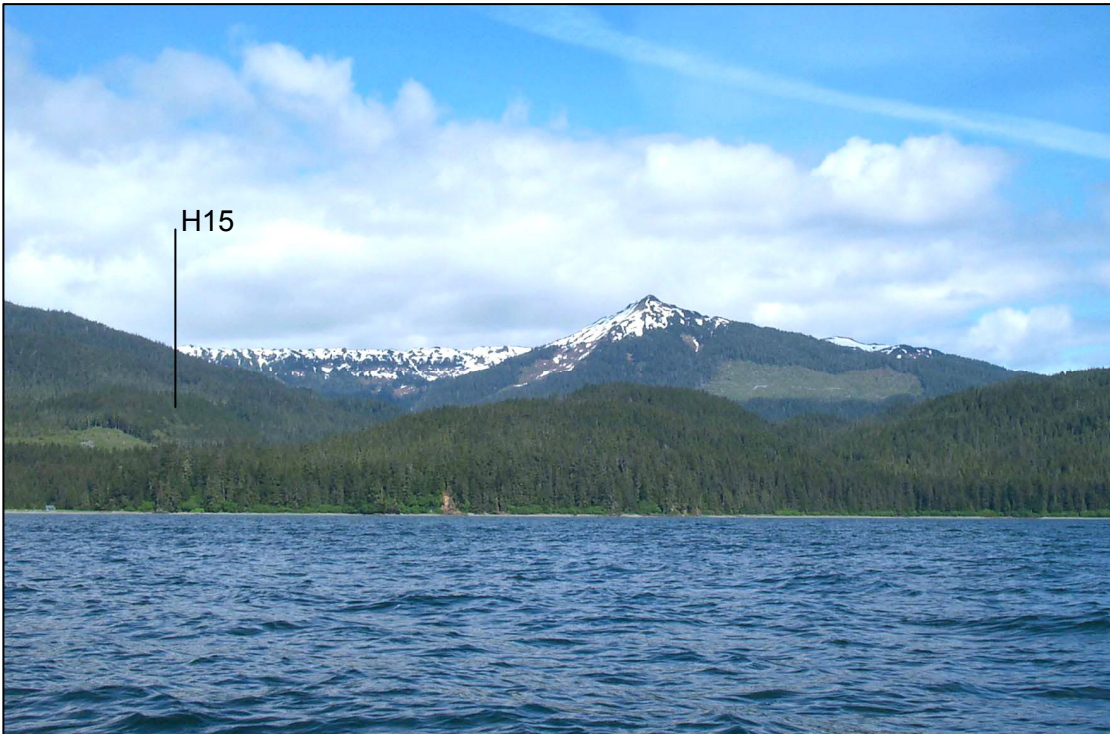


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Figure 3-19. View of the Project Area Looking East from the Northern Part of KVA 4 after the Timber Harvest Proposed under Alternative 5; Observed during the First 10-year Regrowth Cycle



Figure 3-20. View of the Project Area Looking East from the Northern Part of KVA 4 after the Timber Harvest Proposed under Alternative 6; Observed during the First 10-year Regrowth Cycle



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Table 3-40

KVA 6—Ansley Island: Acres Harvested in Seen Area by Alternative

Unit	Acres of Unit in Seen Area – By Alternative				
	2	3	4	5	6
S40	-	5	-	1	-
S41	-	-	1	-	-
S43	-	-	1	-	-
S49	-	-	2	1	-
Total Clearcut with Reserves Acres in Seen Area	-	5	3	-	-
Total Selection Harvest in Seen Area	-	-	1	2	-
Total Acres Harvested in Seen Area	-	5	4	2	-

Notes:

1. The clearcut with reserves prescription has 10 percent retention.
2. The single tree selection and group selection prescription includes diameter limit harvest.
3. Three additional harvest units had areas less than 0.5 acre visible from KVA 6.
4. Total seen area that may not be contiguous within the proposed harvest unit.
5. Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

KVA 7—No Use Ledge

None of the action alternatives propose harvest units visible from No Use Ledge.

KVA 8—Couverden Island

Alternatives 3, 4, and 5 would have a small amount of area visible in the proposed harvest units (Table 3-41). Although most of the visible acres proposed in the alternative would be clearcut with reserves, adverse visual effects from this KVA would not occur because of the small area visible from KVA 8 (less than 5 acres). Alternative 3 would have the most acres of proposed harvest units visible from Couverden Island. Approximately 4 acres would be visible in one unit. Alternatives 2 and 6 do not include units visible from KVA 8.

Table 3-41

KVA 8—Couverden Island: Acres Harvested in Seen Area by Alternative

Unit	Acres of Unit in Seen Area – By Alternative				
	2	3	4	5	6
S40	-	4	-	1	-
S41	-	-	1	-	-
S43	-	-	2	-	-
Total Clearcut with Reserves Acres in Seen Area	-	4	2	-	-
Total Selection Harvest in Seen Area	-	-	1	1	-
Total Acres Harvested in Seen Area	-	4	3	1	-

Notes:

1. The clearcut with reserves prescription has 10 percent retention.
2. The single tree selection and group selection prescription includes diameter limits and patch cuts.
3. One additional harvest unit had an area less than 0.5 acre visible from KVA 8.
4. Total seen area that may not be contiguous within the proposed harvest unit.
5. Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

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Cumulative Effects

Past timber harvest activities have adversely affected this viewshed. Much of the more than 2,000 acres of harvested area is clearly visible from the surrounding Visual Priority Routes (VPRs), Use Areas, and other popular recreation areas. These large clearcuts dominate the landscape, although regrowth of trees in the older units may have resulted in some units meeting modification or partial retention. While the various alternatives would meet the adopted VQOs, most alternatives of the Couverden Timber Sale would add slightly to the cumulative visual effect of the past timber harvests in the area, especially when viewed from East Icy Strait. However, these changes would be small and they would not create enough change to cause the area to reach the threshold of unacceptable effects on scenery. Most units proposed under this project would barely be visible from saltwater (refer to Figures 3-11 to 3-20).

Harvest units with a clearcut with reserves prescription would generally meet a VQO of Maximum Modification upon completion of harvest. After approximately 10 to 15 years, the clearcut harvest area would “green up” due to regeneration and meet the Modification VQO. Within about 30 to 40 years, Partial Retention VQO would generally be met because trees will have reached a size and maturity for a mostly natural setting. Approximately 45 and 60 years after harvest, the area will have grown to resemble a natural setting and would meet a Retention VQO. Units with a clearcut with reserve prescription where visual mitigation measures would be implemented (concentrating reserve trees in visual areas) would meet a Partial Retention VQO, and land around the visible areas would have a visual recovery rate similar to single tree selection and group selection units. Harvest units with a selection cut prescription would meet a Partial Retention VQO after harvest. In 20 years, these areas would most likely meet a Retention VQO.

The cumulative effect on the visible landscape for Alternatives 2 and 3 would meet the adopted VQOs because of the planned visual mitigation measures, which include selection harvest and concentrating leave trees in visible portions of units where feasible. Alternatives 4, 5, and 6 would have less than 100 visible acres in the proposed harvest units. They would also meet the adopted VQOs, but they would add less to the cumulative visual effect of human alteration.

The Forest constructed thresholds for allowable visual disturbance during the creation of the Forest Plan (USDA Forest Service 1997). These visual disturbance thresholds are assigned based on combinations of LUD, Distance Zone, VQO, and VAC ratings within NFS land. The thresholds for allowable disturbance are outlined in Table 3-42. Table 3-43 details the percent of land disturbance for each alternative within the Value Comparison Units (VCUs) that make up the project area (VCU 1170, 1180, 1990, 1200). The percent of disturbed land under each of the alternatives, including the no-action alternative, are based on the proposed harvest units and past timber harvest in the project area VCUs. Only past timber harvest are presented in the percent disturbed in Alternative 1 in Table 3-43. Currently, the visual

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Table 3-42
Percent Allowable Visual Disturbance

Land Use Designation (LUD)	Distance Zone (DZ)	VQO	Low VAC	Interm VAC	High VAC
Scenic Viewshed	FG	R	8	10	10
	MG	PR	8	15	20
	BG	PR	20	20	20
	NS	MM	20	20	20
Timber Production	FG	M	15	20	25
	MG	MM	50	50	50
	BG	MM	50	50	50
	NS	MM	50	50	50

Source: USDA Forest Service, Appendix B, Table B-6. 1997a.

Note: FG = Foreground, MG= Middleground, BG = Background, MM = Maximum Modification, NS = Not Seen, LUD = Land Use Designation, DZ = Distance Zone, R = Retention, PR = Partial Retention; Percentages in Alternative 1 only reflect past timber harvest.

disturbance threshold is only exceeded in a portion of the Scenic Viewshed LUD not seen from VPRs and Use Areas. This area has a Maximum Modification VQO. The action alternatives do not propose additional timber harvest in this heavily disturbed area. Cumulatively, none of the alternatives combined with past and reasonably foreseeable actions would cause the project area landscape to reach or exceed the threshold of allowable visual disturbance as outlined in the Forest Plan (Table 3-43).

Foreseeable projects in the Couverden project area for the next 10-year planning period include installation of a small boat dock and boat ramp, ongoing road maintenance, and public road use. These activities would not add to adverse cumulative effects in the viewshed. Thinning in older harvest units (which was completed in 2003), by improving tree growth, may have a positive cumulative effect over the next 10 years. No reasonably foreseeable land-disturbing activities are planned on state and private land in the planning area. Public road use and recreation are not expected to add to cumulative effects.

Table 3-43
Percent of Disturbance within the Project Area VCUs

LUD	DZ	VQO	Alternative 1 - No Action			Alternative 2			Alternative 3			Alternative 4			Alternative 5			Alternative 6		
			Low VAC	Interm VAC	High VAC	Low VAC	Interm VAC	High VAC	Low VAC	Interm VAC	High VAC	Low VAC	Interm VAC	High VAC	Low VAC	Interm VAC	High VAC	Low VAC	Interm VAC	High VAC
Scenic Viewshed	FG	R																		
	MG	PR																		
	BG	PR		1%	4%		3%	7%		3%	6%		2%	4%		2%	6%		2%	5%
	NS	MM		2%	77%		2%	77%		2%	77%		2%	77%		2%	77%		2%	77%
Timber Production	FG	M																		
	MG	MM	19%	3%		19%	3%		19%	3%		24%	4%		19%	3%		19%	3%	
	BG	MM		3%	5%		4%	10%		4%	9%		4%	6%		3%	8%		3%	5%
	NS	MM		4%	29%		5%	30%		5%	30%		5%	30%		4%	30%		5%	30%

Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.
 Note: FG = Foreground, MG= Middleground, BG = Background, MM = Maximum Modification, NS = Not Seen, LUD = Land Use Designation, DZ = Distance Zone, R = Retention, PR = Partial Retention; Percentages in Alternative 1 only reflect past timber harvest.

Other Environmental Considerations

The following sections of Chapter 3 describe resources and other considerations that are likely to remain unaffected by the proposed action or alternatives or that will not be affected to a significant degree. Concerns about many of these were raised during scoping. The Forest Plan has addressed the management implications of most of these issues through establishment of Forest-wide Standards and Guidelines that are designed to prevent, reduce, or mitigate adverse effects when implemented at the project level. Even though significant effects are not anticipated, these resources are discussed here because measurable effects or differences may be incurred by implementation of the various alternatives. More detailed descriptions of these effects can be found in the relevant resource reports available in the project planning record.

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Land Ownership

The majority of the land in the Couverden project area, approximately 44,547 acres, is National Forest System (NFS) land. The project area also includes approximately 4,192 acres of land that belongs to the state of Alaska (state park land) and approximately 783 acres of private land (divided into several small parcels). The state and private lands are located along the shore. Table 3-44 shows the distribution of land in the project area.

The NFS land within the project area are assigned four Land Use Designations (LUDs): Timber Production, Scenic Viewshed, Semi-remote Recreation, and Old-growth Habitat. Management direction for these LUDs is summarized in Chapter 1. Figure 1-2 shows the location of the LUDs and of the non-NFS land.

NFS land in Sections 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, and 16, Township 42 South, Range 62 East have been selected by the Huna Totem Corporation (Figure 1-3). The Huna Totem Corporation has over selected lands and may not choose to receive all or part of the lands in the project area. Proposed Units S35, S36, S38, S39, S40, S41, S42, S43, S44, and small portions of H17 and H24 are in the over section lands. There is also a Native allotment application for a coastal portion of Section 31, Township 41 South, Range 62 East (Figure 1-3). The application has not yet been adjudicated. No proposed units would be affected by this application. Figure 1-2 displays the location of the land allocations and VCU within the project area.

All alternatives would be consistent with the Forest Plan. All Forest Plan Standards and Guidelines for each LUD would be followed.

Environmental Consequences

Direct and Indirect Effects

The proposed alternatives for the Couverden project area would not affect land ownership. If any of the action alternatives are adopted, there would be a small change in land allocations. The Old-growth Habitat LUD would increase by approximately 788 acres. The Timber Production LUD would decrease by the same amount (refer to the alternative discussion in Chapter 2 and the Wildlife section in Chapter 3).

Table 3-44
Land Ownership/Administration within the Project Area (Acres)^{1/}

	Acres
National Forest System Land	
Timber Production LUD	23,448
Scenic Viewshed LUD	9,831
Semi-Remote Recreation LUD	8,470
Old-growth Habitat LUD	2,798
Total National Forest System Land	44,547
State Land	4,192
Private Land	783
Total Project Area	49,522

^{1/} Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

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Cumulative Effects

Cumulative effects of past actions include the transfer of 4,192 acres of NFS land to state ownership and 783 acres to private ownership. Future changes in land ownership are not reasonably foreseeable at this time. State and private lands have not been managed for timber, and harvest is not expected to occur on these lands in the foreseeable future. The majority (4,192 acres) is within a state park.

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Geology, Minerals, Karst, and Soils

The following discussion and analysis is based on the Geology, Minerals, and Karst Resource Report (Foster Wheeler Environmental 2003g) and the Soil Resource Report (Foster Wheeler Environmental 2003h) located in the project planning record. The analysis also includes application of Standards and Guidelines found in Chapters 3 and 4 of the Forest Plan (USDA Forest Service 1997a).

Affected Environment

Geology

The geologic history of Southeast Alaska is characterized by the attachment, movement, deformation, and development of large crustal blocks referred to as terranes. Terranes vary in age and are bounded by large fault lineaments and shear zones. The Couverden project area lies within the Alexander terrane (Brew and Ford 1984). The attachment or accretion of these crustal blocks to the existing continent is interpreted to have occurred over hundreds of millions of years and has resulted in highly deformed, metamorphosed rocks associated with numerous intrusive igneous bodies. Most of these intrusions occurred in two episodes. The first occurred approximately 120 million years ago and the second approximately 90 million years ago. Both of these episodes are associated with regional-scale temperature elevations (Dusel-Bacon et al. 1996). Deformation along major shear zones continued until 57 million years ago (McClelland and Mattinson 2000).

The accretion of terranes and intrusion by igneous bodies was fundamental for mineralization and karst development in Southeast Alaska. The stress-fields associated with the movement of crustal blocks resulted in shear zones, faulting, regional heating, and fluid movement led to mineralization and carbonate recrystallization. Tectonic movement of crustal blocks and erosion by glaciers have exposed deep crustal rocks and mineralization in the area. As a final result of isostatic rebound following glaciation and sea level changes, some young marine deposits are now located above sea level.

The glacially modified landscape of the Couverden project area has yielded youthful geologic exposures to the extent that much of the biodiversity and plant associations are controlled by the geological units and recent geological history. These processes, coupled with human-made changes to the landscape, have exposed mineral deposits and bedrock, including carbonate.

Project Area Geology

U.S. Geological Survey (USGS) 1:600,000 scale regional mapping (Gehrels and Berg 1992) characterizes the bedrock in the project area as Silurian sedimentary rocks (greywacke and mudstone turbidites and subordinate olistostromal deposits, layers, lenses of limestone, and conglomerate).

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Oligocene and Eocene basalt and andesite, Devonian basalt, Eocene granodiorite, and Silurian carbonate map units are shown on the Gehrels and Berg map within 10 miles of the project area.

The bedrock geology of the Couverden field area is characterized as meta-sediments of marine turbidite facies, intruded by igneous dykes and carbonate veins. Metamorphosis of the sedimentary facies is most pronounced at the dike contacts (contact metamorphism).

Minerals

The project area is within the Southern Chilkat Range Area of the West Lynn Canal Subarea in the Juneau Mining District. According to the Alaska Land Information System (ALIS), there are no current active claims in the area (Table 3-45). All claims were closed or withdrawn by 1994.

The majority of the claims in the project area were filed either by Home Shore Minerals, Inc., or Wm. G. Salisbury.

The Bureau of Mines (1989) describes argillite, calcite veins, and andesitic to basaltic dikes in the area, and states that “Low-grade mineralization is sporadic but no concentrations are known to have been found...”

Table 3-45
Mining Claims

Township	Range	Section(s)	Types of Claims ^{1/}	Active Claims	Reported Minerals Mined ^{1/}
41S	61E	24, 25	Lode	None	NA
41S	62E	19, 20, 24, 25, 28, 29, 30, 31, 32, 33, 34, 35, 36	Lode	None	NA
41S	63E	14, 24, 26	Placer	None	NA
41S	63E	22	Lode	None	NA
41S	63E	23	1 Lode, 7 Placer	None	Silver, gold, copper, zinc, lead ^{2/}
42S	62E	2, 3, 4, 5, 6	Lode	None	NA

NA: Data was not available.

1/ Extraction information from Jane Albrecht, BLM (communication dated October 15, 2002)

2/ This claim is located on the eastern shore of Howard Bay.

Karst

None of the proposed harvest units or roads are in the same watersheds as the karst areas. No karst landscape features (i.e., epikarst, caves, sinkholes, collapsed channels, and emergent or disappearing streams) were identified in the field or from aerial photographic analysis in these watersheds. An area near the northeast boundary of the project area (on the east side of Howard Bay) is considered a karst landscape.

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Soils

Soil development in Southeastern Alaska is influenced by high levels of rainfall, cool marine temperatures, and moderately low average soil temperatures. Under these conditions, organic detritus decomposes slowly, resulting in an accumulation of organic material. A thick organic surface horizon composed of forest litter is common on mineral soils. Deep organic soils develop where bedrock or other restrictive soil horizons impede the movement of water. Mineral soils develop as bedrock, glacial, and alluvial deposits weather. These soils are generally thin on the recently glaciated landforms of Southeast Alaska.

While soils provide the foundation for forest growth and ecosystem health, they can also erode and may harm aquatic resources when transported into streams and rivers. Timber harvest and road building can affect soil productivity and soil stability. Loss of soil due to mass wasting can also decrease the productivity of the site. Geomorphic processes in the forests include a variety of landslide types (mass wasting) and erosion of exposed soil (surface erosion). These processes occur naturally in the forested mountains. They are, however, uncommon in unmanaged areas of Southeast Alaska. Timber harvest and logging roads can increase the frequency and magnitude of mass wasting and surface erosion. For mass wasting to impact the aquatic environment, the debris must be delivered to waterbodies.

Management of Soil Resources in the Tongass National Forest

The Forest Plan (USDA Forest Service 1997a) includes the following goals for soil resources:

- ♦ Minimize soil erosion resulting from land disturbing activities,
- ♦ Maintain soil productivity forest-wide, and
- ♦ Minimize stream sediment transported to streams from land-disturbing activities.

These goals were set to meet Alaska Region soil quality standards and attain state of Alaska water quality standards forest-wide. Standards and guidelines for land use activities, such as the Couverden Timber Sale, include the avoidance of irreversible or serious and adverse effects on soil and water resources. The specific standards and guidelines related to soil and water are located on page 4-83 of the Forest Plan (USDA Forest Service 1997a) and are incorporated here by reference. Forest Plan management prescriptions include: 1) delineate the location of high hazard soils, riparian, and other sensitive areas on project maps to ensure their recognition, proper consideration, and protection, and 2) apply Best Management Practices (BMPs) to all land-disturbing activities as a process to protect the beneficial uses of water from non-point sources of pollution (USDA Forest 1996).

Soil Groups

The soils and landforms in the Couverden project area reflect a diverse history that includes Pleistocene glaciation, which covered the region until about 8,000 to 10,000 years ago. The glaciers carved the southwestern and southern draining u-shaped valleys of the three major drainages within the project area. The glaciers exposed bedrock while depositing glacial till and lateral moraines along the margins and valley bottom of the larger drainages in the project area. In addition, higher sea levels and isostatic depression due to the weight of the glaciers created an environment where marine sediment similar to glacial till, was deposited below about 400 feet in the project area. The extent of the marine sediment varies at different locations throughout the Pacific Northwest coast. Investigations in the Juneau area place the maximum elevation of marine sediment at about 700 feet (Miller 1973), although the depositional environment of the Gastineau Channel was likely different than that of the Couverden project area. The elevation of marine deposits in the project area were estimated to occur below 400 feet in elevation based on field evidence and information provided by Forest Service personnel (Foster Wheeler Environmental 2003h). These rocks and glacial deposits are the parent materials of the soils that cover the project area.

The soils in the project area are composed of mineral soils (developed from weathered rock materials) and organic soils (developed from decomposed plant materials). Within these two broad groups, more specific subdivisions occur, and most soils sampled in the field had a significant organic component near the surface. Three primary soil groups are important in the project area, including 1) the broad mineral soils group composed mainly of sand, silt, clay, gravel, and rocks; 2) mineral soils formed over compact glacial till; and 3) organic soils composed of decomposing organic material. The Soil Resource Report (Foster Wheeler Environmental 2003h) displays the soil mapping units for watersheds with management activities. The watersheds in the eastern portion of the project area have no proposed management activity and, therefore, are not discussed in this analysis. Volcanic ash soils are not found in the project area.

Mineral Soils

Mineral soils originate from deposits of glacial till, outwash, lake deposits, alluvium, and colluvium. These soils have a potential for landslides when they occur on steep slopes. The mineral soil surface typically consists of partially decomposed organic material. Soil depths range from less than 20 inches to more than 20 feet in Southeast Alaska, although most soils are at the lower end of this range. Soil varies from well drained to poorly drained. Mineral soils comprise about 36 percent of the analysis area.

Glacial Till Soils

Glacial till soils are a subgroup of mineral soils that formed in compact, poorly sorted deposits of glacial origin. These soils are typically found on lower valley sidewalls and low ridgetops. They are of management concern

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because of the potential for landslides. The dense compact glacial till that underlies these soils is very impermeable. Water accumulates in the subsoil at the contact with the dense till, forming a layer that is relatively unstable and susceptible to sliding. Glacial till soils comprise about 25 percent of the analysis area.

Organic Soils

Organic soils are common and widely distributed in the project area, and are generally found on glacial deposits on relatively flat valley bottoms. About 17 percent of the analysis area soils are organic. Forested organic soils range are poorly drained. Non-forested organic soils are usually poorly or very poorly drained except for McGilvery soils. They range from about 3 inches to over 40 feet in depth. If non-forested, they support a muskeg or alpine meadow. The organic soils series in the project area include the Kushneahin, Kaikli, McGilvery, and Kina soil series. McGilvery soils are shallow, well-drained organic soils. The Forest Plan (USDA Forest Service 1997a) indicates that SMUs with McGilvery are tentatively suitable for harvest but require harvest systems capable of at least partial suspension over the entire length of the yarding distance over McGilvery soils to avoid exposing underlying bedrock. There is one unit (S39) that has approximately 13 acres in a Riparian Management Area (RMA) that consists of 25 percent McGilvery soils.

Environmental Consequences

Geology	None of the alternatives would have direct or indirect effects on the overall geology of the project area as long as timber harvest activities are conducted according to the requirements of the Forest Plan.
Minerals	None of the action alternatives would have direct effects on mineral resources. The development of new roads would indirectly increase accessibility to prospecting for mineral deposits. Excavation associated with new road construction would also provide additional rock and soil exposures that would assist in interpretation of the project area geology.
Karst	None of the action alternatives would have direct or indirect effects on karst resources. No karst areas are located within watersheds where harvest-related activities would occur under any alternative.
Soils	Timber harvest effects on soils can include erosion, mass wasting, loss of productive soil, and adverse changes to the soil's physical characteristics in terms of nutrient value, soil chemistry, moisture, temperature, and near-surface density and porosity. Overall, the detrimental changes to the long-term productivity of the soils from a well-managed logging program are relatively minor. Impacts to forest productivity would result from the removal of productive areas from regrowth by the construction and development of roads, quarries, landings, and log transfer facilities (LTFs).
Soil Productivity	Soil productivity is the inherent capacity of a soil to support the growth of specific plant communities. Soils provide the foundation for plant growth and timber health. Deep, well-drained mineral soils are the most productive

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sites for tree growth even though tree rooting is generally shallow. Site productivity generally decreases with increasing soil moisture and/or shallow water tables.

Timber management activities can influence soil productivity and its related nutrient content in a number of ways both as a function of harvest activities and road construction. Detrimental soil disturbance is defined as a disturbance resulting in significant change in productivity and is defined in the USDA Soil Quality Standards (USDA Forest Service 1992). These include changes due to soil compaction, displacement, erosion, puddling, and burning. Nutrient loss can occur through the harvesting of timber biomass, but the thick organic layer at the soil surface in Alaskan forests generally provides an ample reservoir of nutrients (USDA Forest Service 2001). Harvesting to a 10-inch top rather than to a 6-inch top to improve harvest economics would result in more down wood and standing small trees being left in units, which would be beneficial for long-term productivity. Roads and associated quarry and landing areas would be removed from timber production.

Erosion

In the forested areas of Southeast Alaska, the organic duff layer and underlying mineral soils can absorb rainfall up to the highest precipitation intensities (Swanston 1997). Consequently, overland water flow that results in surface erosion by processes, such as sheetflow, rill, and gully erosion, is uncommon.

Management activities have the potential to increase surface erosion, both by exposing inorganic material that is susceptible to erosion and by promoting and concentrating overland flow. Timber harvest and road construction can expose soils to overland flow.

Road-cuts can intercept the shallow subsurface flow along a hillside and concentrate runoff in ditch lines, which can cause erosion in the ditch or adjacent cutslope and deliver sediment to streams at road crossings. This process can increase the effective drainage network in the watershed as the roads route water to road-stream crossings. Excessive road and surface erosion from road surface runoff can result in the delivery of fine sediment to streams. Road surface erosion has been shown to increase with the amount of road traffic due to surface disturbance from vehicle wheels (Reid and Dunne 1984). Traffic is generally very light in the analysis area, except during timber harvest, because the roads do not connect to any other road system. There are currently about 45 miles of road bed in the project area, including unclassified roads that are in various stages of revegetation.

Mass Wasting

Mass wasting in its various forms (debris avalanche-debris flow, landslide, rock fall, soil creep, etc.) is a natural process in the Tongass that may deliver soil, rock, and debris to the aquatic environment. These processes introduce stream gravel and large woody debris needed to maintain aquatic habitat. They can occur as a result of natural processes or management activities. Debris avalanches are the dominant form of failure on steep forested slopes in Southeast Alaska. Debris avalanches do not usually occur as rotational failures, but as relatively coherent masses of saturated material flowing downslope along a shallow, planar detachment surface. All

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but one landslide investigated in the field were shallow and occurred within the soil horizons (Foster Wheeler Environmental 2003h).

When and where a failure occurs depends on several factors, including the steepness, shape, and length of the slope; the degree of water saturation of the soil; the weight of the soil; and the internal strength of soil overburden. Steep slopes are more likely to fail than gentle slopes, and long concave slopes are more likely to fail than convex slopes or short slopes with varying grades. Slopes greater than approximately 67 percent approach the internal friction angles for soils commonly found in the Tongass (e.g., Swanston 1969) and have, therefore, a significant landslide potential. Slopes greater than 72 percent are considered to be extremely vulnerable to mass wasting in the Tongass. The Forest Plan states the following (USDA Forest Service 1997a, p 4-484):

At the forest plan level, slope gradients of 72% or more are removed from the tentatively suitable timber base due to high risk of soil mass movement and accelerated erosion of class IV channel systems. At the project planning level, the Forest Supervisor or District Ranger may approve timber harvest on slopes of 72% or more on a case-by-case basis, based on the results of an on-site analysis of slope and class IV channel stability and an assessment of potential impacts of accelerated erosion on downslope and downstream fish habitat, other beneficial uses of water, and other resources.

About 12 percent of the Couverden analysis area has slopes greater than 72 percent, although most of the steeper terrain is located at higher elevations above the proposed harvest units. It is important to note, however, that one-half of the observed landslides occurred on slopes less than 72 percent (Foster Wheeler Environmental 2003h).

Landslides are influenced by soil saturation, as saturated soils over impermeable bedrock and compact glacial till are more likely to slide than well-drained soils over permeable bedrock. The pre-existing moisture content of the soil, the hydraulic conductivity of the soil, and the intensity of recent storms determine the degree of soil saturation. Forest management can affect soil stability by causing the decay of strength-providing root systems, which anchor soils; increasing soil moisture levels by reducing evapotranspiration; and by compacting soils and reducing soil structure (Wu and Swanston 1980, Swanston 1997, Johnson et al. 2000). Road and quarry construction can undercut slopes, increase slope loading, concentrate water flow and discharge onto unstable sites, and disturb the soil with heavy machinery and blasting (Swanston 1997).

Areas harvested in the past in Southeast Alaska have more frequent landslide events than do non-harvested areas. Swanston and Marion (1991) showed that the rate of occurrence of landslides in harvested areas from 1963 to 1983 was 3.5 times greater than in non-harvested areas. However, landslides in harvested areas during that time period were smaller and at lower elevations, occurred on gentler gradients, and traveled shorter distances than landslides in pristine areas.

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Road building in Southeast Alaska can contribute to mass wasting, as well as surface erosion. When road-triggered landslides occur, the volume of sediment released can be several orders of magnitude greater than the sediment that would gradually erode from the exposed road surface. Studies in the Pacific Northwest (Lyons and Beschta 1983, Megahan and Kidd 1972) indicate that roads cause more erosion in general and cause greater numbers of landslides than timber harvest. The Forest Plan (USDA Forest Service 1997a) Standards and Guidelines state that where feasible, the location of roads on slopes greater than 67 percent should be avoided.

Ten of the eighteen landslides observed in the analysis area were assumed to be influenced by management activities (Foster Wheeler Environmental 2003h). Generally, these were shallow-rapid landslides and are no longer active. Landslides were assumed to have been influenced by management activities if they occurred within a clearcut or intersected a road prism. However, cause and effect were not proven in each case and there is a possibility that some of these slides could have occurred without the management activity. Most of the landslides visited and observed were within the managed area; there could have been more landslides outside the managed area that were not visited or observed because they were not near a road, clearcut, or proposed unit.

The standards and guidelines incorporated into the Forest Plan (USDA Forest Service 1997a) were developed partially in response to management-related mass wasting events on the Tongass National Forest, and are designed to minimize landslides resulting from management.

The Mass Movement Index (MMI) provides a qualitative ranking of the stability of land areas based on the slope shape, length, and gradient; drainage features; soil drainage and depth; and the geology of soil parent material (Alexander 1987). The MMI classification ranges from MMI 1 to MMI 4, where 4 is most likely to fail, and 1 would be considered least likely to fail. There is a significant risk of failure associated with harvest if mitigation is not in place on MMI 4 soils, and a moderate risk even with mitigation (Swanston 1997).

For MMI 3 units, there is a moderate risk of management-related failure and mitigation may be needed. For MMI 2 and MMI 1, standard BMPs can be used without special mitigation controls with success. The Forest Service (USDA Forest Service 1993) cataloged 140 landslides in the Tongass National Forest following one storm in Southeast Alaska. Of those, 87 percent occurred in MMI 3 soils, and 71 percent of the 140 landslides occurred in harvested areas. MMIs have been developed for the project area based on soil features and slopes. Within the analysis area, approximately 16 percent of the area is MMI 4 and 19 percent is MMI 3. The Soil Resource Report (Foster Wheeler Environmental 2003h) shows these areas within the Couverden analysis area. Table 3-46 summarizes soils in harvest areas by MMI hazard rating presented by watershed and harvest unit.

Table 3-46
Harvest Acres by Alternative Shown by Mass Movement Index Ranking

Watershed/ Drainage	Alternative 2				Alternative 3				Alternative 4				Alternative 5				Alternative 6			
	MMI 1	MMI 2	MMI 3	MMI 4	MMI 1	MMI 2	MMI 3	MMI 4	MMI 1	MMI 2	MMI 3	MMI 4	MMI 1	MMI 2	MMI 3	MMI 4	MMI 1	MMI 2	MMI 3	MMI 4
Homeshore Creek	73.4	8.9	0	0	66.9	3.0	0	0	0	0	0	0	25.2	0	0	0	0	0	0	0
Humpy Creek	148.6	328.2	6.9 ^{1/}	0	138.0	230.0	1.5	0 ^{2/}	119.0	118.7	5.9 ^{1/}	0	36.3	88.4	0	0	85.2	58.9	1.5	0 ^{2/}
North Group	32.3	147.5	0	0	27.4	35.2	0	0	14.7	4.9	0	0	17.3	28.6	0	0	5.6	3.7	0	0
South Group	113.2	118.5	0	0	105.2	151.5	0	0	83.3	91.1	0	0	80.5	54.8	0	0	0	17.1	0	0
Swanson Creek	0	0	0	0	0	0	0	0	87.0	33.4	8.1	0	33.0	3.2	0	0	0	0	0	0
Total^{3/}	368	603	6.9	0	338	420	1.5	0	304	248	14	0	192	175	0	0	91	80	1.5	0

1/ 3.8 acres of MMI 4 soils in the Humpy Creek drainage were re-evaluated and designated MMI 3 soils, based on slope.

2/ Some units may contain small inclusions of MMI 4 soils (less than 0.1 acre), but these would not be harvested.

3/ Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

Note: MMI = Mass Movement Index

Table 3-47
Ground Disturbance by Watershed Determined by Harvest Prescription and Logging System

Watershed/ Drainage	Acres in Watershed	Alternative 2		Alternative 3		Alternative 4		Alternative 5		Alternative 6	
		Unit Acres in Alternative	Harvest Related Disturbance (acres)	Unit Acres in Alternative	Harvest Related Disturbance (acres)	Unit Acres in Alternative	Harvest Related Disturbance (acres)	Unit Acres in Alternative	Harvest Related Disturbance (acres)	Unit Acres in Alternative	Harvest Related Disturbance (acres)
Homeshore Creek	6,762	82.3	4.0	69.8	3.4	0.0	0.0	25.2	1.2	0.0	0.0
Humpy Creek	6,183	483.7	27.4	369.5	20.2	243.7	11.4	124.7	6.1	145.7	8.0
North group	3,435	179.8	8.4	62.5	4.1	19.6	0.9	45.8	2.7	9.4	0.7
South Group	8,129	231.7	13.7	256.7	14.8	174.4	9.8	135.3	7.6	17.1	0.9
Swanson Creek	13,375	0.0	0.0	0.0	0.0	128.5	10.2	36.3	3.0	0.0	0.0
Total^{1/}	37,884	978	54	759	43	566	32	367	21	172	10

1/ Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

Note: Table depicts soil disturbance, not acres harvest (vegetation disturbance). Refer to Table 3-50 for acres of past and present harvest disturbance.

Table 3-48
Proposed and Existing Road Lengths in Analysis Area (miles)^{1/}

Watershed	Existing Classified Open Roads	Existing Classified Closed Roads	Unclassified Roads ^{2/}	Alternative 2			Alternative 3			Alternative 4			Alternative 5	Alternative 6	
				Proposed Classified on Temporary Roadbed	Proposed Temporary	Proposed Classified	Proposed Classified on Temporary Roadbed	Proposed Temporary	Proposed Classified	Proposed Classified on Temporary Roadbed	Proposed Temporary	Recon-struction	New Road	Proposed Classified on Temporary Roadbed	Proposed Temporary
Homeshore Creek	2.9	1.6	1.3	0.3	0.2	0.6	0.3	0.2	0.5				0.0		
Humpy Creek	8.1		1.8	0.8	1.9	0.8	0.8	1.9	0.5	0.7	1.0		0.0	0.4	0.4
North Group	6.2		0.6		0.6	0.5		0.5	0.0		0.2		0.0		0.1
South Group	10.9		3.5	0.5	0.8	0.8	0.5	0.9	0.8	0.2	0.8		0.0		
Swanson Creek	2.6	3.4	4.6							0.5	0.6	2.9	0.0		
Total^{1/}	30.7	5.0	11.8	1.6	3.5	2.7	1.6	3.5	1.8	1.4	2.6	2.9	0.0	0.4	0.5

1/ Miles are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

2/ Former temporary roads in various stages of revegetation. Some are usable as OHV trails.

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Direct and Indirect Effects

Information on which this discussion is based is summarized in the following tables. Harvest prescription acreages are found in the *Watershed and Fisheries Affected Environment* section, Table 3-51.

Under all alternatives, areas that were indicated in preliminary mapping as MMI 3 and MMI 4 or slopes greater than 72 percent have been investigated in the field and either confirmed to be less than 72 percent slope or noted on unit cards and excluded from harvest. Also, no new roads would cross slopes greater than 67 percent and all new roads would be closed following harvest. Roads would be closed at the first practical point, either by tank trap at the beginning of the road, at the first stream crossing, or by official road closure order.

The alternatives have been analyzed and ranked based on disturbance area for harvest prescription, yarding method, landing area, and new road area (Table 3-47). Soil disturbance monitoring on the Forest indicates that cable-based yarding systems result in approximately 6 percent ground disturbance and shovel yarding systems approximately 12 percent (USDA Forest Service 1993). Helicopter yarding results in between 1 and 5 percent disturbance (USDA Forest Service 1993). Refer to the Soils Resource Report (Foster Wheeler Environmental 2003h) for further details. These data are summarized in below.

Alternative 2 would have the greatest harvest area and largest amount of harvest related disturbance, approximately 54 acres. Alternative 3 would have approximately 43 acres of harvest and yarding related disturbance, Alternative 4 approximately 32 acres, Alternative 5 approximately 21 acres, and Alternative 6 approximately 10 acres.

The action alternatives can also be ranked based on the total disturbance area related to roads and landings. Alternative 2 would have the highest risk of harvest-related landslides of any of the alternatives (Foster Wheeler Environmental 2003h), and the greatest risk for surface erosion due to the amount of new road and the estimated traffic levels. With respect to soils, the total disturbance area for Alternative 2 would be approximately 61 acres. Alternative 6 would create the least amount of total disturbance for all of the action alternatives, approximately 6 acres, slightly less than under Alternative 5.

Table 3-48 shows proposed miles of new temporary and classified road construction by alternative. Alternative 2 proposes the most construction at a total of approximately 7.7 miles. Alternatives 4 and 3 propose approximately 7.0 and 6.8 miles, respectively. The figure for Alternative 4 includes 2.9 miles of reconstruction. Alternative 6 is much lower, proposing 0.9 miles of road construction and Alternative 5 proposes no new road construction.

Cumulative Effects

Cumulative effects result from the incremental effects of past, present, and reasonably foreseeable future actions. Cumulative effects were analyzed with respect to mineral resources, karst, and soils.

Effects on mineral resources would be a small increase the exposures of bedrock in borrow pits and road cuts.

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No karst has been mapped, located, or observed in any of the watersheds to be harvested; therefore, no cumulative effects are anticipated on karst.

Effects on soil are related to issues of soil productivity, erosion, and mass movement frequency. Loss of productivity, increased erosion, and increased frequency of mass movement would be mitigated by Forest Plan Standards and Guidelines, BMPs, and project design requirements included on road and unit cards. Cumulative effects on soil productivity are expected to be limited largely to the loss of soil during road construction. Roads that are kept open and continue to be used will continue to deliver sediment to streams as a result of surface erosion, as discussed in the Watershed and Fisheries Resources Report (2003c).

Cumulative effects from past and proposed harvest can be ranked by alternatives in terms of soils disturbed or significantly reduced in long-term productivity by harvest and harvest-related activities, as shown in Table 3-49. The analysis method is described above. Total past soil disturbance in all watersheds is estimated as 788 acres. Under Alternative 2, disturbance would increase to 901 acres; under Alternative 3, 881 acres; under Alternative 4, 852 acres; under Alternative 5, 817 acres; and under Alternative 6, 804 acres. Differences of percentages of area disturbed between watersheds remains virtually constant between alternatives, with the greatest percent of watershed area disturbed in the Humpy Creek watershed and the North Group drainage, and the least percentage of watershed area disturbed in the Swanson Creek watershed.

Foreseeable actions include road maintenance and road use. Road maintenance and use are not expected to increase cumulative effects on minerals, karst, or soils. There are no foreseeable actions on non-National Forest System (NFS) land in the project area. All or part of the over-selected land may be transferred to private ownership. Transfer of these lands and future management of any selected land, however, is not foreseeable at this time.

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Table 3-49
Total Maximum Cumulative Soil Disturbance Area for Each Alternative by Watershed

					Alternative 2		Alternative 3		Alternative 4		Alternative 5		Alternative 6	
Watershed/ Drainage	Watershed/ Drainage Size (acres)	Soil Disturbance from Existing Roads (acres) ^{1/}	Past Harvest Soil Disturbance (acres) ^{2/}	Total Past Soil Disturbance (acres)	Total Maximum Cumulative Soil Disturbance (acres) ^{3/}	Percent of Watershed	Total Maximum Cumulative Soil Disturbance (acres) ^{3/}	Percent of Watershed	Total Maximum Cumulative Soil Disturbance (acres) ^{3/}	Percent of Watershed	Total Maximum Cumulative Soil Disturbance (acres)	Percent of Watershed	Total Maximum Cumulative Soil Disturbance (acres)	Percent of Watershed
Homeshore Creek	6,762	70	58	128	139	2.0	138	2.0	128	1.9	130	1.9	128	1.9
Humpy Creek	6,183	119	49	168	217	3.5	206	3.3	191	3.3	176	2.8	181	2.9
North Group	3,435	82	24	106	128	3.7	117	3.4	109	3.2	110	3.2	108	3.1
South Group	8,129	173	39	212	243	3.0	246	3.0	233	2.9	223	2.7	213	2.6
Swanson Creek	13,375	127	47	174	174	1.3	174	1.3	191	1.4	178	1.3	174	1.3
Total^{4/}	37,883	571	217	788	901	2.4	881	2.3	852	2.3	817	2.2	804	2.1

1/ Assumes a 100 feet wide corridor and includes quarries and landings.
2/ Assumes 10 percent disturbance level and no recovery from past disturbance.
3/ Potential harvest disturbance (from Table 3-47) plus potential road and landing disturbance plus total past disturbance.
4/ Acres are based on GIS mapping and numbers are rounded; therefore, totals may vary slightly. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.
5/ Table 3-49 displays acres of soil disturbance, not total acres of vegetation disturbance. Refer to Table 3-50 for acres of past and proposed harvest disturbance.

Watershed and Fisheries

This section describes the aquatic and freshwater fisheries resources in the Couverden project area. Refer to the Watershed and Fish Resource Report (Foster Wheeler Environmental 2003c) for further discussion of these resources, including details on inventory procedures. The project area contains many watersheds, several of which would not be affected by any of the proposed alternatives. The watersheds affected by proposed alternatives include Homeshore Creek watershed, Humpy Creek watershed, Swanson Creek watershed, and two drainage areas that include several small streams that flow directly into the Icy Strait, North Group, and South Group drainages (Figure 3-21). For discussion purposes, these are collectively referred to as watersheds/drainages.

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Class I: Streams and lakes with anadromous or adfluvial fish or fish habitat; or, high quality resident fish waters, or habitat above fish migration barriers known to provide reasonable enhancement opportunities for anadromous fish

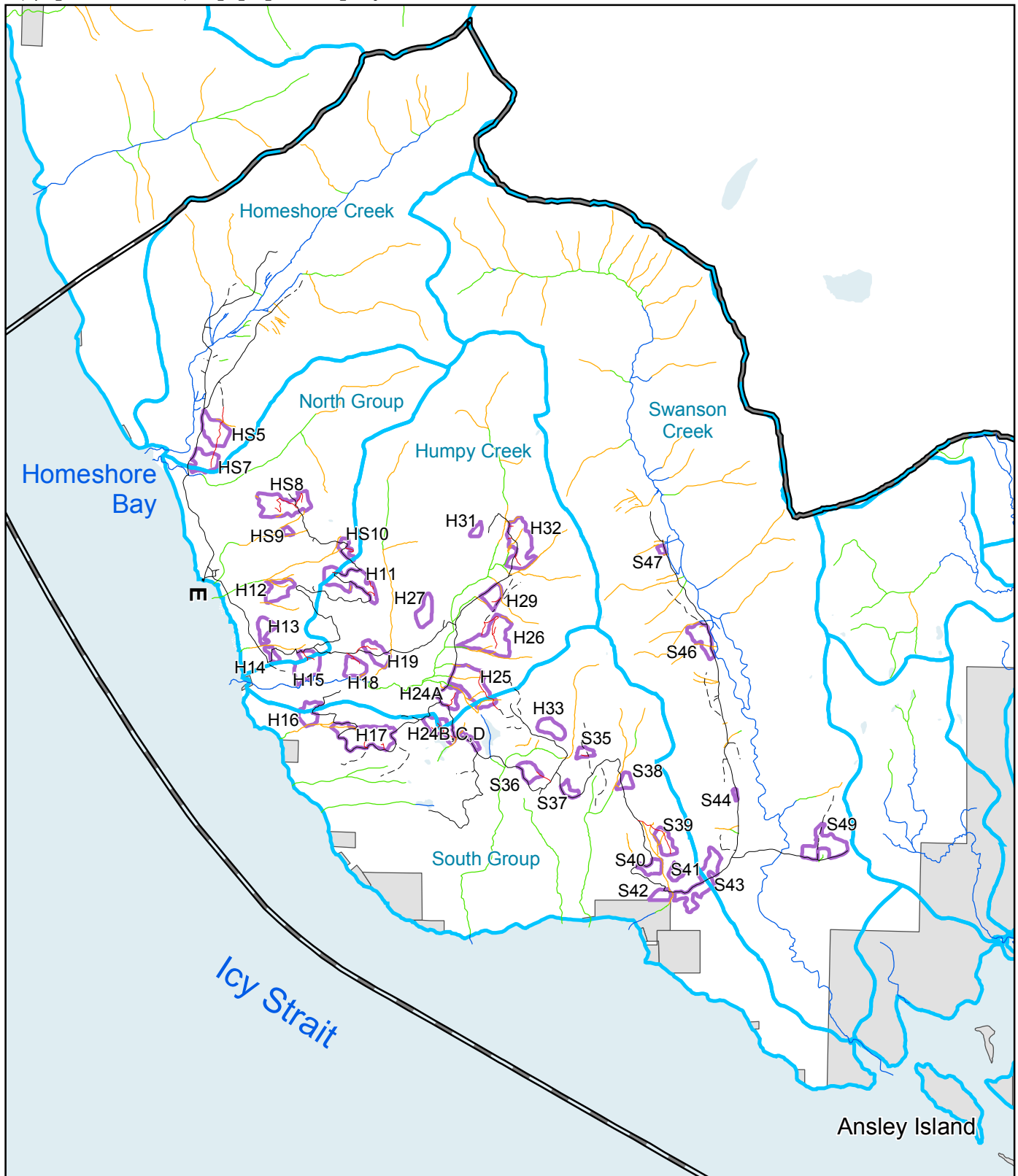
Class II: Streams and lakes with resident fish or fish habitat and generally steep gradients where no anadromous fish occur

Class III: Perennial and intermittent streams that have no fish populations or fish habitat, but have sufficient flow or sediment and debris transport to directly influence downstream water quality or fish habitat capability

Class IV: Other intermittent, ephemeral, and small perennial channels with insufficient flow or sediment transport capabilities to directly influence downstream water quality or fish habitat capability

This evaluation of existing resources focuses primarily on watershed conditions, including fish habitat and fisheries resources, and secondarily on marine conditions and water quality. As would be expected, resource conditions vary between watersheds/drainages because of natural variations in drainage areas, watershed geology, morphology, hydrology, cover types, elevation ranges, stream channel types, and fish access/distributions. The type, amount, and location of past timber harvest and associated road construction can also affect watershed hydrology, sediment delivery to streams, large woody debris (LWD) input, stream temperature, and nutrient levels. Improper culvert design or installation can affect fish movement (Furniss et al. 1991, Meehan 1991, Casipit et al. 2000, USDA Forest Service 2002a). Clearcut timber harvest and road building has occurred in all five watersheds/drainages between 1979 and 1992; however, less than 6 percent of the project area and less than 9 percent of any individual watershed/drainage have been harvested (Table 3-50). Road miles and densities vary among watersheds, with approximately 35.7 miles of classified road in the entire project area. In addition, approximately 9.8 miles of temporary road were also built. All temporary roads and approximately 5 miles of classified roads have been closed, and culverts and bridges removed or bypassed to reduce the risk of sediment input. Approximately 85 stream crossings remain. Of these, five are bridge crossings on Class I streams. One culvert may block anadromous fish passage, and four culverts may block the movement of resident fish (1999 road condition survey).

Soil/land types with extreme landslide potential (Mass Movement Index [MMI] 4)—an indicator of areas that may be affected by management activities—cover approximately 16 percent of the project area (Table 3-51). About one-fourth of the streams are Class I streams containing anadromous fish habitat (Table 3-52). High-gradient contained streams, the dominant channel types, have limited fish habitat and function as conduits for sediment and debris delivery to downstream reaches. Watershed/drainages with higher gradient slopes have greater potential for mass wasting. Higher stream densities and ratios of transport to depositional streams reflect more efficient sediment transport out of a watershed/drainage. Watersheds that



Legend

- LTF - Log Transfer Facility
- Proposed Road
- Existing Classified Road
- Former Temporary Road
- Stream Class I
- Stream Class II
- Stream Class III

- Water Body
- Non-NFS Land
- Watershed/Drainage Boundary
- Unit Pool (Unit# H33)
- Project Boundary

Figure 3-21
Watershed/Drainage



Table 3-50

Past Harvest and Proposed Harvest Areas and Extents by Couverden Watersheds/Drainages^{1/}

Watershed/ Drainage	Total Area (acres)	Existing		Alternative 2			Alternative 3			Alternative 4			Alternative 5			Alternative 6		
		Acres	%	Acres	New %	Total %	Acres	New %	Total %	Acres	New %	Total %	Acres	New %	Total %	Acres	New %	Total %
Homeshore Creek	6,762	577	8.5%	82	1.2%	9.7%	70	1.0%	9.6%	--	0.0%	8.5%	25	0.4%	8.9%	--	0.0%	8.5%
North Group	3,435	236	6.9%	180	5.2%	12.1%	63	1.8%	8.7%	20	0.6%	7.5%	46	1.3%	8.2%	9	0.3%	7.1%
Humpy Creek	6,183	490	7.9%	484	7.8%	15.8%	370	6.0%	13.9%	244	3.9%	11.9%	125	2.0%	9.9%	146	2.4%	10.3%
South Group	8,129	386	4.7%	232	2.9%	7.6%	257	3.2%	8.0%	174	2.1%	6.9%	135	1.7%	6.4%	17	0.2%	5.0%
Swanson Creek	13,375	474	3.5%	--	0.0%	3.5%	--	0.0%	3.5%	129	1.0%	4.5%	36	0.3%	3.8%	--	0.0%	3.5%
Total	37,884	2,163	5.7%	978	2.6%	8.3%	759	2.0%	7.7%	566	1.5%	7.2%	367	1.0%	6.7%	172	0.5%	6.2%

^{1/} Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

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Table 3-51
Extent of Hazardous Soils/Land Types by Couverden
Watersheds/Drainages^{1/}

Watershed/Drainage	Total Area (acres)	Hazardous Soil/Land Types (acres)		
		High (MMI 3)	Very High (MMI 4)	Percent Very High (MMI 4)
Homeshore Creek	6,762	1,947	1,919	28.4%
North Group	3,435	738	282	8.2%
Humpy Creek	6,183	1,662	857	13.9%
South Group	8,129	149	174	2.1%
Swanson Creek	13,375	2,762	2,743	20.5%
Total	37,884	7,258	5,975	15.8%

1/ Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

Note: MMI = Mass Movement Index

Table 3-52
Stream Lengths and Densities by Stream Classes and Couverden
Watersheds/Drainages

Watershed/ Drainage	Class I		Class II		Class III		Total (I,II,III)	
	Length (mi)	Density (mi/mi)	Length (mi)	Density (mi/mi)	Length (mi)	Density (mi/mi)	Length (mi)	Density (mi/mi)
Homeshore Creek	8.2	0.78	1.9	0.18	9.4	0.89	19.5	1.84
North Group	0.6	0.10	3.1	0.58	6.5	1.22	10.2	1.90
Humpy Creek	1.5	0.16	6.4	0.66	10.2	1.06	18.2	1.88
South Group	0.3	0.02	10.4	0.82	7.0	0.55	17.7	1.39
Swanson Creek	15.0	0.72	4.2	0.20	21.7	1.04	40.9	1.96
Total	25.6	0.43	26.0	0.44	54.8	0.93	106.5	1.80

Notes:

1. Class IV streams are not included in this table because, by definition, Class IV streams do not have sufficient transport capacity to affect fish habitat.
2. mi = mile
3. mi/mi² = miles per square mile
4. Miles are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

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have higher portions of high gradient (steep) slopes, higher stream densities, and lower ratios of transport to depositional stream miles are relatively more sensitive to disturbance. The relative magnitude of these factors are used as an index of watershed sensitivity to disturbance. Using this index, the Homeshore Creek watershed appears most sensitive and the South Group drainage least sensitive (Table 3-53).

Fish and aquatic resources in the Tongass National Forest provide major subsistence, supply commercial and sport fisheries, and fulfill traditional and cultural values for Alaska Natives. The unusual number and diversity of freshwater fish habitats of the Tongass National Forest provide spawning and rearing habitats for most of the fish produced in Southeast Alaska. The annual spawning migrations of anadromous fish are necessary for the function of many plant and animal communities. Anadromous fish known to occur in the analysis area streams include pink (*Oncorhynchus gorbuscha*), chum (*O. keta*), and coho salmon (*O. kisutch*) and steelhead (*O. mykiss*). Resident fish, which may have anadromous forms, include cutthroat trout (*O. clarki*) and Dolly Varden char (*Salvelinus malma*).

The Lower Columbia River chinook salmon (*Oncorhynchus tshawytscha*), Upper Columbia River spring-run chinook salmon, Puget Sound chinook salmon, Upper Willamette River chinook salmon, Snake River fall-run chinook salmon, Snake River spring and summer runs of chinook salmon, Snake River sockeye salmon (*O. nerka*), and steelhead (*O. mykiss*) from the Snake River basin and the Lower, Middle, and Upper Columbia River sections are listed as threatened or endangered, and are briefly addressed in the Threatened, Endangered, and Sensitive species section. None of the aforementioned threatened or endangered fish species are known to occur in any streams within the project area. These species, however, may be found in the outer marine waters to the west of the Tongass National Forest (USDA Forest Service 2003).

The marine environment of the project area also includes a wide variety of habitats. The shallow marine waters, mud flats, and estuaries provide habitat for Dungeness crab and juvenile salmon, which is particularly important because young salmon use the nearshore area to forage when first migrating from freshwater to the sea. SCUBA diving observations of the log transfer facility (LTF) that would be used for the Couverden Timber Sale confirmed the use of the area by juvenile salmon (Robinson-Wilson et al. 1987). Other animals observed include barnacles, snails, sea cucumbers, tritons, sea peach, finger sponge, nudibranchs, anemones, plume worm, a variety of urchin species, a variety of clams, several sea star species, and a variety of brown and red algae. Juvenile pink, chum, and coho salmon, trout, Pacific sand lance (*Ammodytes hexapterus*), sculpins, capelin, and herring (*Clupea harengus pallasii*) were observed at nearby beach seines in 1981 and 1982.

Maintenance of clear, cool, well oxygenated water, free of pollutants or contaminants (including fine sediment) is critical for healthy aquatic systems. Evidence of landslides exist in the project area. Slides that appear to be associated with past management activities have occurred in every watershed/drainage (Weston 2002). These likely contributed sediment

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Table 3-53
Relative Sensitivity of Couverden Watersheds/Drainages

Watershed/ Drainage	Area (mi)	Percent Area > 55% Slope	Percent Area > 72% Slope	Stream Density (mi/mi)	High Transport Stream Miles	Depositional Stream Miles	High Transport- to-Depositional Stream Miles Ratio
Homeshore Creek	10.57	51.7%	26.7%	1.84	10.82	2.45	4.4
North Group	5.37	29.5%	14.2%	1.90	8.46	0.09	94.0
Humpy Creek	9.66	31.7%	12.8%	1.88	11.66	1.19	9.8
South Group	12.70	7.7%	2.4%	1.39	13.02	0.69	18.9
Swanson Creek	20.90	29.0%	10.5%	1.96	24.01	7.46	3.2
Total	59.20	29.0%	12.4%	1.80	67.97	11.88	5.7

Notes:

1. Only Class I, II, and III streams were included in this analysis because, by definition, Class IV streams do not have sufficient transport capacity to affect fish habitat.
2. mi² = square mile
3. mi/mi² = miles per square mile
4. Miles are based on GIS mapping and numbers are rounded. Numbers are not exact due to small differences in GIS coverages and/or due to rounding.

and turbidity in the past and may continue to do so; however, most are relatively small slides and appear to have had little effect on streams. Consumptive water uses in the project area are minor. No developed water uses, designated campgrounds, or Forest Service recreational cabins are present. The private recreational cabin south of proposed Unit S42 and the three cabins near the mouth of Swanson Creek may use water from nearby streams. Recreational water use by campers, especially during the spring and fall hunting season, also occurs.

Homeshore Creek Watershed

The average elevation of Homeshore Creek watershed (10.6 square miles) is moderately high (1,600 feet). The watershed has a relatively long reach of low-gradient streams with moderately wide floodplains in the lower reaches of the basin. The sideslopes of the watershed increase abruptly. The mainstream channel splits into two forks; the larger extends north near the upper end of the valley in a low- to moderate-gradient basin. The upper end of the basin contains snowfields above the tree line much of the year. This watershed has the highest portions of extreme landslide potential soils (Table 3-51), Class I streams (38 percent) (Table 3-52), and very steep slopes (26.7 percent) (Table 3-53). Homeshore Creek has a relatively low ratio of high transport-to-depositional streams, suggesting greater areas for sediment deposition relative to areas likely to pass sediment downstream if disturbed.

Effects from past disturbances have been relatively low in this watershed. The watershed has the highest portion of past harvest (8.4 percent), but all harvest occurred prior to 1983, allowing substantial regrowth of vegetation, which has resulted in hydrologic recovery. Less than 2 percent of the soil has been disturbed (refer to Table 3-49). Road density, including closed roads (0.6 mile per square mile), is the second lowest of the

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watersheds/drainages. There are only four active road/stream crossings within the watershed, including one bridge. No culverts block fish passage in this watershed.

Homeshore Creek contains anadromous fish stocks of pink, chum, and coho salmon. Steelhead are not likely present (Don Martin, personal communication, USDA Forest Service, Juneau, AK, November 14, 2002). Dolly Varden are present and cutthroat trout may be. Alaska Department of Fish and Game (ADF&G) fish resource maps indicate that pink and chum salmon exist to the fork in the mainstream. Spawning surveys by ADF&G noted peak counts of 4,000 chum salmon and 48,800 pink salmon utilizing the mainstem of Homeshore Creek (Foster Wheeler Environmental 2003c). Sampling during summer 2002 confirmed Dolly Varden and juvenile coho salmon in the lowest reaches of floodplain tributaries on the east fork (near Unit HS4) (Foster Wheeler Environmental 2003c). No cutthroat trout were captured in any of the samplings. Use of the east fork by anadromous fish may be limited (Don Martin, personal communication, USDA Forest Service Juneau, AK, November 14, 2002). A steep waterfall serves as a barrier to upstream fish passage to the east fork where the stream branches (upper part of Unit HS2). Although the main channel does not have a distinct barrier, it gradually increases in slope to a point where it is not used by anadromous fish.

North Group Drainage

The North Group drainage, located between the Homeshore and Humpy watersheds, is the smallest of the watersheds/drainages (5.4 square miles). It includes one larger watershed area in the north and three smaller drainage watersheds that flow directly into Icy Strait. Much of the drainage has moderately low elevation (average of 1,270 feet), but the headwaters of the northernmost stream reach nearly 3,500 feet. Typical of the region, headwaters of the largest streams begin in alpine regions, while valley areas are mostly forested. Streams are primarily Class III (64 percent); less than 6 percent are Class I (Table 3-52). The dominance of high-gradient contained channels (over 80 percent of streams) is typical of small steep basins. Slopes in potential harvest areas are moderate, and few anadromous or resident fish are present. The North Group drainage is intermediate for sensitivity to disturbance (Table 3-53). Less than 13 percent of the area has extremely steep slopes. Stream density is moderate; however, this watershed has few depositional streams relative to transport streams, indicating that little sediment would accumulate if stream channels or riparian areas were disturbed.

Past disturbance in the North Group drainage has been moderate compared to the other watersheds/drainages. Approximately 7 percent of the drainage has been harvested, although nearly half of that occurred relatively recently in 1992. Approximately 3 percent of the soil has been disturbed (Table 3-49). Road density, including closed roads, is the highest of the watershed/drainages (1.2 miles/square mile). There are 17 road/stream crossings, a relatively high number considering the small size of the drainage.

The stream in the larger northern drainage of the North Group contains chum and pink salmon. Juvenile Dolly Varden were also observed in the

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lower reaches above the bridge adjacent to Unit HS7. Anadromous fish use at least the lower half mile of this stream, but are not known to occur in any other North Group stream. Resident Dolly Varden were collected in the two southern-most streams. Their upstream distribution is limited by a waterfall near Unit H12, and several falls below the road crossing near Unit H13 block all upstream fish movement in one of these streams. Dolly Varden were the only species collected near the stream mouth; gradient and channel characteristics are not conducive for anadromous fish spawning even in the lowest portion of this stream. No culverts block fish passage in this drainage.

Humpy Creek Watershed

The headwater areas of Humpy Creek watershed (9.7 square miles) are mountainous, extending to an elevation of about 4,000 feet. At 1,570 feet, this watershed has the second highest average elevation. The headwaters contain some of the steepest terrain in the project area. Compared to other watersheds/drainages, Humpy Creek has a high percentage (13.9) of extreme landslide areas (Table 3-51). Stream characteristics indicate that fish potential is limited. Most streams are high-gradient streams; 56 percent are Class III and only 9 percent are Class I (Table 3-52). The Humpy Creek watershed is intermediate for sensitivity to disturbance (Table 3-53). It has a relatively large proportion (14.2 percent) of extremely steep slopes. Stream density (1.88/square mile) is typical of the area. The watershed has a relatively low proportion of depositional streams relative to transport streams, suggesting that additional sediment would be carried away from most areas.

Total past harvest covers 8 percent of Humpy Creek, which is the second highest of the watersheds/drainages but still relatively low. Most harvest occurred prior to 1991, allowing sufficient time for vegetation recovery. Less than 3 percent of the soil has been disturbed (Table 3-49). Road density, including closed roads, is 1.0 mile/square mile, average for the project area. Road/stream crossings are most abundant in this watershed, with 34 crossings on open roads. Road crossing density is also highest (3.5 crossings/square mile). If not maintained, culverts may plug, which could potentially contribute additional sediment to the system. Three Class I channels may be blocked to anadromous fish passage. Also, four culverts on Class II stream channels may block the movement of resident fish (1999 road condition survey).

Humpy Creek supports pink, chum, and coho salmon. Past ADF&G spawning surveys here documented peak counts of 1,000 and 27,800 chum and pink salmon, respectively (Foster Wheeler Environmental 2003c). Dolly Varden are present, and the creek may have cutthroat trout. The ADF&G fish resource map shows anadromous fish distribution extending about half a mile up the northwest fork. However, 2002 field observations suggest that distribution is more limited due to very high-gradient cascades near the mouth of the west fork. No fish were captured in the northwest fork upstream of the bridge near Unit H19 in 2002 or in 1982 (Foster Wheeler Environmental 2003c, USDA Forest Service 1982). The exact extent of anadromous fish in the mainstem above this fork is not clear. That reach is considered a Class II stream, although the 1982 survey noted that coho salmon juveniles were observed up to about 5.25 river miles, the portion of

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South Group Drainage

stream with a gradient of 2 to 5 percent. Fish sampling in upstream tributaries near units H26 and H29 collected only Dolly Varden. A series of large falls in the main channel, ranging from 12 to 35 feet high adjacent to Unit H32, serve as a total barrier to all fish passage.

The South Group drainage (12.7 square miles) has the lowest average elevation of the watersheds/drainages (820 feet). The South Group drainage, southwest of the Swanson Creek watershed, consists of seven small watersheds that flow directly into Icy Strait, and includes the two largest lakes in the project area. Only 2.1 percent of the drainage contains soils with extreme landslide potential, which is the lowest of the watersheds/drainages (Table 3-51). High-gradient contained channels dominate (70.5 percent), which is typical of steep-sided drainages. High-gradient streams often contain resident, but not anadromous, fish habitat (Paustian et al. 1992). Relatively few streams are Class I (1.6 percent); many are Class II streams (58.9 percent) (Table 3-52). The South Group drainage appears moderately resistant to disturbance (Table 3-53). It has the lowest proportion of extremely steep land (less than 3 percent) and the lowest stream density (1.4 miles/square mile). Also, the proportion of high-gradient streams to depositional streams is high, second only to the North Group, suggesting that much potential additional sediment would pass through the system.

Approximately 4.8 percent of the area within the drainage basin has been harvested, all between 1990 and 1992. Road density is in the middle range of the watersheds/drainages, 1.1 miles/square mile. Less than 3 percent of the soil has been disturbed (Table 3-49). There are 23 road/stream crossings in the South Group drainage, which is second only to the Humpy Creek watershed. However, the density of stream crossings is in the middle range, 1.8 crossings/square mile. These relatively low densities suggest that the overall input of sediment from existing roads would be average among the watersheds/drainages.

ADF&G fish resource maps designated only the southernmost stream as having anadromous fish use; however, the central stream may also have anadromous fish. Pink salmon are present near the mouth of the southernmost stream. No fish were captured in the northernmost stream for several hundred feet below Unit H16 during 2002. Increased gradient likely restricts upstream fish access, except in the lowest reaches. The two drainages to the south are considered to have resident fish, which could include Dolly Varden and cutthroat trout. No proposed units would occur near these streams. The central stream, which drains the largest lake in the analysis area, is considered to have anadromous fish near the mouth. The 1982 Forest Service fish survey, however, noted coho salmon juveniles well upstream. The exact extent of upper anadromous fish habitat is not clear. Fish sampling in the lake outlet in 2002 captured only Dolly Varden. No fish were found in the outlet stream of another lake adjacent to Units H24D and B. Forest Service fish sampling at the culvert road crossing near Unit S36 captured Dolly Varden, but sampling near S35 did not detect fish. Stream gradient below this road crossing is high and likely prevents upstream fish movement. The southernmost stream in this drainage may have anadromous fish near its mouth. Electrofishing to about 700 feet

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downstream of Unit S42 captured Dolly Varden and cutthroat trout, but no coho salmon. Fish sampling above high gradient cascades between this lower area and the road captured no fish. These cascades are likely barriers to all fish. Anadromous fish distribution is likely confined to the lower 1,300 feet of the stream. No culverts block fish passage in this drainage.

Swanson Creek Watershed

The Swanson Creek watershed (20.9 square miles, approximately one-third of the project area), extends along the entire eastern boundary, abutting the headwaters of all of the watershed/drainages except the North Group. The wide, central, low-gradient stream valley includes one north-south mainstream channel and an east-west upper valley. Elevations reach over 4,000 feet, the highest in the project area. The average elevation is 1,270 feet. The headwaters retain snow throughout the summer at higher elevations. The valley walls are generally abrupt and steep, with moderately wide valley bottoms, especially in the lower two-thirds of the basin. The watershed has a high proportion of extreme landslide potential (20.5 percent), second only to Homeshore Creek (Table 3-51). Swanson Creek has a high proportion of Class III (53 percent) and Class I stream channels (36.7 percent) (Table 3-52). Floodplain channels generally flow to the valley floor through beaver ponds on low-gradient side channels of the mainstem. Nearly all tributaries are high-gradient contained channels, many of which leave alluvial fans at the valley bottom. Swanson Creek watershed is potentially sensitive to disturbance (Table 3-53). While the proportion of the watershed with steep slopes is moderate (10.5 percent), stream density is relatively high, indicating a greater potential for sediment delivery to streams from hillslope disturbances. The transport-to-deposition stream ratio is the lowest of any watershed/drainage, indicating more depositional reaches and lower sediment transport capability in this system than in others.

Approximately 3.5 percent of the Swanson Creek watershed has been harvested, and all harvest occurred 12 to 13 years ago. Field observations suggest that timber harvest and road construction have resulted in increased landslides and sediment input to streams (Weston 2002). Approximately 1 percent of the soil has been disturbed, the lowest of any watershed (Table 3-49). The watershed contains approximately 9 miles of road and has the lowest road density (0.4 mile/ square mile). The active number of stream crossings (7) are also low relative to the rest of the project area. Bypassing of culverts along much of the existing road system has removed potential sediment sources from clogged culverts. Small to large slides in past harvest areas occur along the existing road system, especially near the lower slope. At least one slide has reached the floodplain area. Some slides occurred in areas with 25 to 30 percent slopes—areas that would not typically be considered high hazard—suggesting that the watershed may be relatively sensitive to land disturbance activities.

Swanson Creek contains anadromous pink, chum, and coho salmon and steelhead. Peak spawning survey counts of 3,300 and 17,000 chum and pink salmon were found in Swanson Creek during ADF&G surveys (Foster Wheeler Environmental 2003c). A partial barrier to upstream fish passage just below the road crossing stops pink and chum salmon but not coho

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salmon from using the upper stream. Dolly Varden resident, and possibly the anadromous form, are present within the system; cutthroat trout may also be present. Steelhead use occurs in the lower reaches, but use above the barrier is unknown (Don Martin, personal communication, USDA Forest Service, Juneau, AK, November 14, 2002). Coho salmon distribution extends well upstream of any proposed units. Apparent coho salmon juveniles were observed along the side channel of the Swanson Creek near Unit S46. No coho salmon juveniles were collected in stream channels exiting Unit S46 in 2002. Fish distribution does not appear to extend into any proposed harvest units in the Swanson Creek watershed, although fish were present in channels adjacent to Swanson Creek near some units.

Environmental Effects

In general, activities associated with management of forest resources may affect the amount of large woody debris, rock, gravel, and fine sediment produced, and the timing of their delivery to the aquatic environment. Effects may include increased erosion, changes in water runoff patterns, removal of trees from Riparian Management Areas (RMAs), and altered stream temperature from loss of shading. These physical changes may ultimately influence aquatic organisms. Also, improperly designed or constructed stream crossings may either impede fish passage or create debris jams that may result in large washouts and sediment delivery to fish-bearing streams.

Factors considered in evaluating the effects of the proposed alternatives on watershed and fish resources include total area harvested by method, relative amount of watershed/drainage harvested, and changes in road lengths and culvert crossings. Generally, lower extents of ground-disturbing activities would be expected to result in fewer adverse impacts. Numerous design measures have been incorporated into each of the action alternatives to avoid or reduce possible effects on the fishery and watershed resources (Foster Wheeler Environmental 2003c). The direct, indirect, and cumulative effects on these processes from harvest-related activities under each of the proposed alternatives are presented in the following sections.

Hydrologic Effects

Timber harvest may affect interception and evapotranspiration of rainfall; snow accumulation and melt; and, through changes in soil structure, water infiltration and subsurface transmission rates (MacDonald 1991). Large changes in streamflows are not expected, but the exact magnitude of any changes are difficult to predict. Road construction can decrease soil infiltration rates, increase short-term runoff, and redirect flows, concentrating them into previously nonexistent channels. Studies show that harvest of between 20 and 35 percent of a watershed within a period of 5 to 15 years resulted in changes to mainstem streamflows and water yields (Rothacher 1973, Harr et al. 1979, Duncan 1986, Spence et al. 1996). The hydrologic effect is generally diminished when clearcut harvest is replaced with patch or small group selection harvest because the remaining trees use some of the available moisture (Beschta et al. 1995). Watershed conditions are considered "properly functioning" for coastal salmon stocks when road density is less than 2 miles/square mile (National Marine Fisheries Service [NMFS] 1996).

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The percent of each watershed/drainage affected by the proposed alternatives would be small in any action alternative; therefore, hydrological effects from any of these alternatives would also be small. The largest area would be harvested under Alternative 2 (978 acres or 2.6 percent of the project area) (Table 3-50). The highest percent harvested would be 7.8 percent in the Humpy Creek watershed under Alternative 2. Combining this proposed harvest with past activities, Humpy Creek also has the greatest percentage of total harvest, less than 16 percent. This percentage is below the threshold reported in the literature, suggesting that none of the action alternatives would result in changes in watershed hydrology. Most alternatives would include both selective harvest and clearcut with reserves harvesting methods. Only under Alternative 6 would all harvest units be clearcut with reserves (Table 3-54); however, this alternative would harvest the fewest acres, resulting in minimal effects to watershed and fish resources.

New road construction would be limited under all alternatives, resulting in minimal hydrologic effects (Table 3-55 and 3-56). Roads re-opened for harvest (2.9 miles under Alternative 4) would have minimal effect on hydrology because road prisms already exist and road densities would not increase. On average, road density, including closed roads, would be less than 0.9 mile/square mile for the project area. The maximum increase in new road miles and road density would occur under Alternative 2. Road densities in all watersheds/drainages would remain below 1.4 miles/square mile under all alternatives, well below the NMFS (1996) guideline of 2 miles/square mile for "properly functioning" watersheds. All new and all re-opened roads would be closed following harvest, as would 0.8 mile of the Homeshore Road. New roads constructed for this project will be placed in a storage condition after use. Roads in storage are not considered usable by normal vehicle traffic. Temporary roads constructed for this project will be obliterated after use. Roads would be closed at the first practical point, either by a tank trap at the beginning of the road, at the first stream crossing, or by official road closure order.

Stream Sediment

Road construction and vegetation removal exposes soil to erosion, which may induce surface erosion and mass wasting, increasing sediment delivery to streams (Spence et al. 1996). The largest component of management-caused sediment input to streams comes from roads (Reid and Dunne 1984, Furniss et al. 1991). Sediment may enter streams during rain events through road/stream crossings. Debris clogging culverts can trigger mass wasting. Yarding can also cause soil disturbance and increase splash erosion and channelized runoff. Stream buffers and management prescriptions can greatly reduce sediment delivery to streams (Belt et al. 1992, Chamberlin et al. 1991).

New road construction would be limited under all alternatives. Road construction would be highest under Alternative 2 (7.8 miles, a 17 percent increase) and lowest under Alternative 5 (0 miles) (Tables 3-55 and 3-56).

Table 3-54

Proposed Harvest Areas by Harvest Methods, Alternatives, and Couverden Watersheds/Drainages^{1/}

Watershed/Drainage	Acres Harvested by Harvest Method and Alternative ^{2/}															
	Alternative 2					Alternative 3			Alternative 4				Alternative 5		Alternative 6	
	CC	SH	H-SH	H-CC	Total	CC	SH	Total	CC	H-CC	H-SH	Total	SH	Total	CC	Total
Homeshore Creek		82			82		70	70					25	25		
North Group	109	13	54	5	181	35	28	63	15	5		20	46	46	9	9
Humpy Creek	454			29	483	370		370	175	68		243	125	125	146	146
South Group	204	28			232	146	110	256	125	37	12	174	135	135	17	17
Swanson Creek									129			129	36	36		
Total	767	123	54	34	978	551	208	759	444	110	12	566	367	367	172	172

1/ Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

2/ Harvest methods: CC = land based clearcut with reserves; SH = land based single tree selection and group selection; H-CC = helicopter clearcut with reserves; H-SH = helicopter single tree selection and group selection

Table 3-55**New and Reopened Road Lengths by Alternatives and Couverden Watersheds/Drainages**

Road Miles by Alternative											
Watershed/Drainage	Existing ^{1/}	Alternative 2		Alternative 3		Alternative 4		Alternative 5		Alternative 6	
		New ^{2/}	Total ^{3/}	New ^{2/}	Total ^{3/}	New ^{2/}	Total ^{3/}	New ^{2/}	Total ^{3/}	New ^{2/}	Total ^{3/}
Homeshore Creek	5.9	1.1	7.0	1.1	7.0	—	5.9	—	5.9	—	5.9
North Group	6.4	1.1	7.5	0.5	6.9	0.2	6.5	—	6.4	0.1	6.5
Humpy Creek	9.9	3.5	13.4	3.1	13.0	1.7	11.6	—	9.9	0.8	10.7
South Group	14.3	2.1	16.4	2.2	16.5	1.1	15.4	—	14.3	—	14.3
Swanson Creek	9.0	—	9.0	—	9.0	1.1	10.1	—	9.0	—	9.0
Total	45.5	7.8	53.3	6.9	52.4	4.1	49.5	—	45.5	0.9	46.4

1/ Existing open and closed classified and unclassified roads. Note that existing road lengths include closed unclassified roads, some of which may be usable by OHVs.

2/ New classified and/or new temporary roads. Road reconstruction, in the Swanson Creek watershed under Alternative 4 (2.9 miles), is not included in new road lengths.

3/ Total new and existing roads

Note: Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

Table 3-56**Total Road Densities and Percent Increases in Road Miles by Alternatives and Couverden Watersheds/Drainages**

Road Density (mi/mi ²) and Percent Increase Over Existing												
Watershed/Drainage	Area (mi ²)	Existing ^{1/}	Alternative 2		Alternative 3		Alternative 4		Alternative 5		Alternative 6	
		Density	Inc. ^{2/}	Density	Inc. ^{2/}	Density	Inc. ^{2/}	Density	Inc. ^{2/}	Density	Inc. ^{2/}	Density
Homeshore Creek	10.57	0.56	18.7%	0.66	18.7%	0.66	0.0%	0.56	0.0%	0.56	0.0%	0.56
North Group	5.37	1.19	17.2%	1.39	8.5%	1.29	2.5%	1.22	0.0%	1.19	1.9%	1.21
Humpy Creek	9.66	1.03	35.3%	1.39	31.3%	1.35	17.1%	1.20	0.0%	1.03	8.1%	1.11
South Group	12.70	1.13	14.7%	1.29	15.4%	1.30	7.7%	1.21	0.0%	1.13	0.0%	1.13
Swanson Creek	20.90	0.43	0.0%	0.43	0.0%	0.43	12.2%	0.48	0.0%	0.43	0.0%	0.43
Total	59.20	0.77	17.1%	0.90	15.2%	0.89	8.9%	0.84	0.0%	0.77	2.0%	0.78

1/ Existing open and closed classified and unclassified roads. Note that existing density includes closed unclassified roads, some of which are usable as OHV trails.

2/ Increases in road miles from construction of new classified and/or new temporary roads. Road reconstruction, in the Swanson Creek watershed under Alternative 4 (2.9 miles), is not included in the percent increase in road miles.

Note: Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

mi² = square mile, mi/mi² = miles per square mile

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The greatest increase in new road miles would occur in Humpy Creek under Alternative 2 (3.5 miles, a 35 percent increase). Alternative 4 would also temporarily re-open 2.9 miles of closed road in Swanson Creek watershed (Table 3-57). Except for Alternative 4, the majority of new crossings would be on Class IV streams, which would have minimal effect on downstream sediment movement; therefore, the effects of new roads/stream crossings would likely be minor sediment additions under all alternatives except Alternative 4, which may cause a short-term increase in sediment delivery. Removal of culverts after the project is also likely to result in minor sediment additions. Some sediment from the road surface is also likely to reach streams. New roads constructed for this project will be placed in a storage condition after use. Roads in storage are not considered usable by normal vehicle traffic. Temporary roads constructed for this project will be obliterated after use.

The area harvested would be greatest under Alternative 2 and least under Alternative 6 (Table 3-50). Buffers on all Class I, II, and III channels in, or adjacent to, harvest units would reduce sediment delivery to streams. The Homeshore Creek watershed is probably most sensitive to disturbance, but it would have less than 2 percent harvest under any of the alternatives (Table 3-58). None of the harvest activities proposed under the action alternatives would likely result in a significant increase in sediment reaching streams. Alternative 4 would require the longest buffers on nearly 0.8 mile of Class I and II streams (Table 3-58). No direct input of sediment into Class I and II streams would be likely under any alternative because of infrequent harvest near these streams and substantial buffers (greater than 100 feet). The size of buffers on Class III streams varies and may be less than 100 feet. Areas with a high proportion of Class III streams may be more likely to have sediment effects than in other areas due to overland flow of sediment to streams. Alternative 2 has the highest length of buffers for Class III streams (5.6 miles), and Alternative 6 has the lowest (1.0 mile) (Table 3-58). The risk of sediment input to streams is small under any alternative. Humpy Creek would have the highest risk among the watersheds/drainages because it would contain more than 60 percent of all Class III stream buffers in the project area.

Stream Temperature

Removal of trees in the riparian zone can increase stream temperatures, especially in the summer (Spence et al. 1996). The greater the portion of cover removed from a stream, the greater the risk of an increase in temperature in the downstream reaches. The temperature conditions in the analysis area (the northern latitude and cool, cloudy summer climate) suggest high summer water temperatures are unlikely to be a problem, and slight changes in temperature are unlikely to have adverse effects on the biota. Mandatory no-cut buffers established on all Class I, II, and III streams would significantly reduce the risk of adverse temperature-related effects to streams within the project area. The proposed timber harvest units located adjacent to Class I and II streams would have more than a 100-foot no-cut buffer between the harvested areas and all Class I and II streams. Windfirm buffers would result in many buffers greater than 100 feet on Class I, II, and III streams. Also, the relatively narrow channel width associated with Class

Table 3-57

Stream Crossings (Culverts and Bridges) by Alternatives and Couverden Watersheds/Drainages

Watershed/Drainage	Stream Class	Existing on Open Roads	Alternative 2		Alternative 3		Alternative 4		Alternative 5		Alternative 6	
			New	Total	New	Total	New	Total	New	Total	New	Total
Homeshore Creek	I	2(1) ^{1/}		2		2		2		2		2
	II											
	III	1	1	2	1	2		1		1		1
	IV	1		1		1		1		1		1
	Total	4	1	5	1	5	0	4	0	4	0	4
North Group	I	2(1) ^{1/}		2		2		2		2		2
	II	1		1		1		1		1		1
	III	11		11	1	12		11		11		11
	IV	3	2	5		3		3		3		3
	Total	17	2	19	1	18	0	17	0	17	0	17
Humpy Creek	I	2(2) ^{1/}		2		2		2		2		2
	II	3		3		3		3		3		3
	III	14	3	17	3	17	1	15		14	1	15
	IV	15	4	19	4	19	2	17		15	1	16
	Total	34	7	41	7	41	3	37	0	34	2	36
South Group	I											
	II	2		2		2		2		2		2
	III	10	2	12		10		10		10		10
	IV	11	2	13		11	1	12		11		11
	Total	23	4	27	0	23	1	24	0	23	0	23
Swanson Creek	I	1(1) ^{1/}		1		1	3 ^{2/}	4		1		1
	II	3		3		3		3		3		3
	III	1		1		1	8 ^{2/}	9		1		1
	IV	2		2		2	4 ^{2/}	6		2		2
	Total	7	0	7	0	7	15^{2/}	22	0	7	0	7
Total Class I	I	7(5) ^{1/}		7		7	3	10		7		7
Total Class II	II	9		9		9		9		9		9
Total Class III	III	37	6	43	5	42	9	46		37	1	38
Total Class IV	IV	32	8	40	4	36	7	39		32	1	33
Grand Total	All	85	14	99	9	94	19	104	0	85	2	87

1/ Values in parentheses are the number of the total that are bridge crossings.

2/ Reopened crossing on Swanson Creek main road.

Notes:

1. New roads constructed for this project will be placed in a storage condition after use. Roads in storage are not considered usable by normal vehicle traffic. Temporary roads constructed for this project will be obliterated after use.
2. Numbers are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

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Table 3-58
Stream Buffer Lengths in and Adjacent to Proposed Harvest Units by Alternatives
and Couverden Watersheds/Drainages

Watershed/ Drainage	Stream Buffer Length (miles) by Alternative					
	Class	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
Homeshore Total	All	—	—	—	—	—
North Group	I	0.03	0.03	—	—	—
North Group	III	0.87	0.33	0.09	0.02	—
North Group Total	All	0.90	0.36	0.09	0.02	—
Humpy Creek	I	0.26	0.09	0.02	—	0.25
Humpy Creek	II	0.23	0.23	0.23	0.11	0.08
Humpy Creek	III	3.40	2.65	2.34	0.71	0.84
Humpy Creek Total	All	3.89	2.97	2.59	0.82	1.17
South Group	III	1.29	1.33	0.23	0.48	0.14
South Group Total	All	1.29	1.33	0.23	0.48	0.14
Swanson Creek	I	—	—	0.58	—	—
Swanson Creek	III	—	—	0.50	—	—
Swanson Creek Total	All	—	—	1.08	—	—
Total Class I	I	0.30	0.12	0.59	0.03	0.25
Total Class II	II	0.23	0.23	0.23	0.11	0.08
Total Class III	III	5.55	4.31	3.16	1.20	0.98
Grand Total	All	6.08	4.66	3.98	1.35	1.31

Note: Acres are based on GIS mapping and numbers are rounded. Numbers are not exact due to rounding and may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

III stream channels requires a corresponding smaller buffer area to provide adequate streamside shade.

Large Woody Debris

Large woody debris (LWD) is an essential element in streams for maintenance of good trout and salmon habitat in the Pacific Northwest (Bustard and Narver 1975, Bisson et al. 1982, Tschaplinski and Hartman 1983, Heifetz et al. 1986, Murphy et al. 1986, Holtby 1988, McMahon and Hartman 1989, Spence et al. 1996). LWD is important to Class I, II, and III stream function. LWD delivery to streams varies with distance from channel, tree height and stocking levels, and terrain characteristics. In Southeast Alaskan streams, Murphy and Koski (1989) found that 40 percent of LWD originated within 3 feet of the bank and that 99 percent of all LWD originated within 100 feet of the stream channel. Given the current stream buffer prescriptions, none of the alternatives is likely to reduce LWD supply or abundance. Buffers on Class I, II, and III streams would be at least 100 feet wide in most cases.

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Physical Migration Barriers

Only Alternative 4 includes Class I and II road crossings. Three Class I crossings would be re-opened on the Swanson Creek valley main access road. Less than 0.1 mile of stream occurs above these crossings, so any potential passage problems would affect little fish habitat. In addition, re-opening the road would require following the stringent current guidelines for culvert installation, reducing potential passage problems.

Riparian Management Areas

Riparian management areas (RMAs) are stream class and process group size-specific but generally are the established buffer regions adjacent to streams where timber harvest is excluded or restricted. Direct impacts to RMAs may result from vegetation and ground disturbance in these areas. All alternatives provide a high level of riparian protection through mandatory and site-specific design considerations. All potential units were assessed in the field and, where deemed necessary, unit boundaries and riparian buffers were identified. Miles of stream buffers protected by RMAs are shown in Table 3-58.

Marine and Nearshore Resources

The main potential area of concern for the near-shore marine environment is the transport of logs through the LTF. Impacts are typically associated with bottom disturbance from formation of a LTF and log dumping in the shallow near-shore area. The accumulation of bark in shallow, biologically productive zones from log dumping into the marine environment has also been an issue with LTF sites in Southeast Alaska. The LTF site is complete with a filled pier already in place; only minor repair is needed. No additional bottom area would be affected. Also, logs would be transferred directly from pier to barge without in-water dumping or storage of logs under all action alternatives. This would eliminate potential concerns from bark accumulation in the near-shore waters. Because this LTF site is located in a very high energy area, minor amounts of bark that may fall in the water would rapidly be dispersed by currents and wave actions, thus, reducing the risk of adverse bark accumulations. The overall effect to the marine resources from any of the alternatives is expected to be insignificant.

Essential Fish Habitat

Essential fish habitat (EFH) is the water and substrate necessary for fish spawning, breeding, feeding, or growth to maturity. The EFH for the salmon fisheries in Alaska includes estuarine and marine areas from tidally submerged habitat to the 200-mile exclusive economic zone. Freshwater EFH includes streams, rivers, lakes, ponds, wetlands and other bodies of water currently and historically accessible to salmon. EFH for Pacific salmon recognizes six critical life history stages, including (1) spawning and incubation of eggs, (2) juvenile rearing, (3) winter and summer rearing during freshwater residency, (4) juvenile migration between freshwater and estuarine rearing habitats, (5) marine residency of immature and maturing adults, and (6) adult spawning migration. Habitat requirements within these periods can differ significantly, and any modification of the habitat within these periods can adversely affect EFH.

Assessment

Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act states that all federal agencies must consult the National

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Marine Fisheries Service (NMFS) for actions or proposed actions that may adversely affect essential fish habitat. The Act promotes the protection of EFH through review, assessment, and mitigation of activities that may adversely affect these habitats. On August 25, 2000, the Forest Service, Alaska Region, and NMFS came to an agreement about what this consultation entails. The Draft EIS satisfied the consultation requirements by providing a description and assessment of EFH in the project area, a description of the Couverden project and its potential impacts on these habitats, and a description of the mitigation measures that would be implemented to protect these habitats. The formal consultation began when NMFS received a copy of the Draft EIS with the Essential Fish Habitat Assessment. NMFS did not respond in writing as to whether it concurs with this determination of the assessment or make conservation recommendations.

The Couverden project area is located on Chilkat Peninsula in the Juneau Ranger District of the Tongass National Forest. It is north of Icy Strait. It includes about 106.4 miles of Class I, II, or III streams. Of the 106.4 miles of streams, about 25.6 miles are Class I streams that contain abundant populations of coho, chum, and pink salmon. Alternative 2 would include small portions of the inventoried roadless area. The other action alternatives do not propose roads or timber harvest within the roadless area. Up to 4.3 miles of new classified roads would be constructed, depending on the alternative selected. All alternatives would use the existing log transfer facility (LTF). There are five culverts on these roads that do not meet the current standards for fish passage. These will be replaced regardless of which alternative is selected.

The EFH within the project area is primarily fresh water. Logs would be loaded directly on barges. The potential effects on marine habitats include diminished habitat for bottom-dwelling animals and plants due to bark accumulation, and reduced rearing capability for juvenile salmon. Potential effects on freshwater EFH include increased sediment delivery from road use and altered riparian vegetation and disturbed channel integrity from road crossings, which may reduce habitat quality for salmon. Any effects are likely to be minor for the following reasons: 1) the proposed new roads would not cross Class I streams (although 3 crossings would be reconstructed under Alternative 4); and 2) the logs would be loaded directly onto the barges at the transfer site with a negligible amount of wood or bark entering the marine environment. The current in Icy Strait is likely to quickly disperse minor amounts of bark or other debris that enter the water.

Timber harvest near Class I streams and wetlands may have an adverse affect on EFH. By following the standards and guidelines in the Forest Plan, however, the effects on EFH would be minimized for the following reasons.

1. All Class I streams within the project area would be protected by a no-harvest buffer of 100 feet or more in accordance with the Forest Plan and Tongass Timber Reform Act (TTRA).

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2. In areas where wind damage has occurred in the past, buffer widths would be increased, and additional trees would be left standing to assure resistance to windthrow.
3. All Class II and Class III streams would be protected by no-harvest buffers according to the Forest Plan. This minimizes the potential impact to downstream essential fish habitat.
4. Best Management Practices would be implemented to protect water quality and aquatic habitat protection for all freshwater streams within the project area.
5. Temporary road construction would be limited to 3.5 miles or less.
6. The LTF has a valid U.S. Army Corps of Engineer National Pollutant Discharge Elimination System permit and meets applicable requirements.

Conclusions

The Forest Service believes that these mitigation measures will avoid or minimize the effects of the proposed timber harvest on EFH to currently acceptable levels. Effects to EFH are likely to occur only from unforeseen events. A copy of this Final EIS will be given to NMFS and the Forest Service will continue the consultation process with NMFS.

Other Water Quality Issues

Currently, no public drinking waters facilities are located in the analysis area. Several private land holdings occur near the mouths of Humpy Creek, Swanson Creek, and a large tributary in the South Group drainage. It is unlikely that these facilities use water directly from these streams without treatment. Increased suspended sediment is the most likely potential change to water quality from project actions. Also, there is a small possibility of spills (oil, gasoline, diesel) entering surface water. Humpy Creek water quality would have the highest risk of sedimentation under Alternative 2, followed by Alternatives 3, 4, 6 and 5, in that order, based on relative disturbance (harvest and road miles). However, required Best Management Practices (BMPs) include storing equipment and fuel away from streams and specific practices that reduce sediment runoff. As a result, drinking water quality impacts are unlikely for any alternative.

Cumulative Effects

Past effects, current activities, each proposed alternative, and reasonably foreseeable activities were considered in assessing the overall cumulative effects. Disturbances within a watershed due to management activities can be individually small, but may collectively result in larger basin-wide disturbances or cumulative effects. As these disturbances accumulate, they can interact with each other in various combinations over a long period. Cumulative effects may lead to increased erosion, streamflow, and subsequent channel degradation. The degree of the effect is dependent upon the frequency and magnitude of individual impacts, plus the rate of recovery by the watershed. Factors that need to be considered include the

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amount of area harvested, road miles, number and type of streams crossed, and slope area harvested. All contribute to cumulative effects of considered project actions. One of the parameters that takes the effects of all of these factors into account is the percent of a watershed harvested over time. The Forest Plan (USDA Forest Service 1997a) recommends that a benchmark for watershed disturbance is 20 to 30 percent of the watershed harvested within a 30-year period. As displayed in Table 3-49, none of the watersheds/drainages exceeds 3.7 percent cumulative harvest under any alternative. In addition, road densities in all watersheds/drainages would remain below 1.4 miles/square mile (including all classified, unclassified, and temporary road, whether open or closed) under all alternatives, well below the NMFS (1996) guideline of 2 miles/square mile for “properly functioning” watersheds. All new roads would be closed following harvest. Overall, the cumulative watershed disturbance of past and proposed actions is relatively low in all watersheds/drainages.

Cumulative effects also must consider the effects of known and reasonably foreseeable future actions. Currently, there are no additional timber harvests scheduled in the project area or adjacent areas. The only actions expected to occur would be road maintenance and recreational activity. These actions include only minor riparian canopy opening, which may ultimately benefit stream production. Therefore, the overall effects of these actions would not have a negative cumulative effect on watershed and fish resources.

Past harvest in riparian areas (RMZs) influences current and future stream conditions, including temperature, nutrient addition, production, and large woody debris abundance. These factors are all important when considering potential cumulative effects. There has been relatively little harvest along Class I, II, and III streams except in the Homeshore watershed.

Approximately 8 percent of Class I and II RMZs and 4 percent of Class III RMZs have been affected. However, much of this riparian harvest occurred prior to 1983 (78 percent of Class I RMZs and 35 percent of all RMZs). Streams harvested during the early period (prior to 1983) have had substantial recovery of the RMZ vegetation, which is especially important for the Class I streams where fish resources can be most directly affected. No additional harvest is planned for Class I and II RMZs except for road right-of-way clearing. Also, there would be no harvests in the RMZs of the watershed most affected in the past, Homeshore, under any alternative. Therefore, cumulative effects to RMZs and associated fish resources, including past and potential future harvest in RMZs, would be low for any alternative.

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Wetlands

Wetlands are defined as those “areas that are inundated or saturated with surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (CFR 230.41 a (1), U.S. Army Corps of Engineers [USACE] Experimental Laboratory 1987). They are generally valued for the hydrologic, biogeochemical, and habitat functions that they perform.

Regulation and Management

For federal regulatory purposes, wetlands are considered a subclass of Special Aquatic Sites (40 CFR Section 230.3) and have been deemed waters of the United States (33 CFR 328.3). All waters of the United States are subject to regulation through the Clean Water Act by U.S. Army Corps of Engineers and EPA. Sections 404 and 401 of the Clean Water Act were created specifically with the intent “to restore and maintain the chemical, physical, and biological integrity of our Nation’s waters.” Additionally, Executive Order 11990 requires federal agencies “to avoid...adverse impacts associated with the destruction or modification of wetlands...wherever there is a practicable alternative.” It establishes a sequencing policy of avoidance, minimization, and possible mitigation.

Exemptions granted under Section 404(f)(1) permit normal agricultural, ranching, and silvicultural activities, as well as maintenance of existing drains, farm ponds, and roads. The construction or maintenance of forest roads for silvicultural purposes is exempt from regulation when such roads are constructed and maintained in accordance with Best Management Practices (BMPs). BMPs are intended to ensure that flow and circulation patterns and chemical and biological characteristics of water are not impaired as required by the Clean Water Act (USDA Forest Service 1997b).

Under the Forest Plan (USDA Forest Service 1997a), wetlands are protected by their incorporation into non-development Land Use Designations (LUDs). In the development LUDs, the Forest Plan Forest-wide Standards and Guidelines for beach and estuary fringe and riparian areas provide additional protection to wetlands (USDA Forest Service 1997b). The Forest Plan also includes Forest-wide Standards and Guidelines specifically for wetlands, and establishes the following objectives:

- ♦ Avoid alteration of, or new construction on, wetlands, wherever there is a practicable, environmentally-preferred alternative, considering the functions and values of wetlands, as well as other non-wetlands ecosystems in the project area.
- ♦ Minimize the loss of higher value wetlands, especially fens, and minimize the adverse effects of land management activities.
- ♦ Seek to maintain the natural and beneficial functions and values of wetlands.

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Wetlands are known to perform significant hydrologic, biogeochemical, and habitat functions in a watershed. Hydrologic functions include discharge of water to downstream habitat, surface and subsurface water storage, and particulate retention. Biogeochemical functions include organic carbon production and storage, cycling of elements and compounds, and maintenance of characteristic plant communities. The habitat functions include maintenance of characteristic habitat structures and interspersed and connectivity of habitat.

Like much of Southeast Alaska, the Couverden project area contains wetlands. Approximately 26.3 percent of the land in the project area is mapped as wetland. The types of wetlands in the project area are shown in Table 3-59 and described below.

Estuary Wetlands: Estuarine systems are unique ecosystems located at the interface of freshwater, terrestrial, and marine environments. They are characterized by tidal influences and saline water. These areas typically have poorly drained mineral soils that have higher pH values and nutrient contents than other wetland types. Vegetation in these areas is generally characterized by salt tolerant plants. Estuaries support marine invertebrates, such as clams and crabs, saltwater fish, and anadromous fish. These species, in turn, support a wide variety of wildlife, including waterfowl, wading birds, bald eagles, small mammals, and bear. Estuarine wetlands serve very important biological and water quality functions in relation to primary and secondary productivity, structure and chemical habitat attributes, and species diversity. Hydrologic functions of maintaining streamflow and flood control are not characteristic of estuarine wetlands because of their position in the landscape. Estuarine wetlands exist in the project area at the mouths of the streams, but they are not included in any proposed units.

Palustrine Forested Wetlands: Palustrine systems are freshwater systems not associated with rivers, ponds, or lakes. Palustrine forested wetlands are dominated by tree species and understories consisting of shrubs, mosses, and forbs. Tree species include mountain hemlock (*Tsuga mertensiana*), western hemlock (*Tsuga heterophylla*), and shore pine (*Pinus*

Table 3-59
National Wetlands Inventory Wetland Area within the Project Area

Wetland Type	Total Wetland Acres	Percent of Project Area
Palustrine Emergent	94	0.2%
Palustrine Scrub-Shrub	2,625	5.3%
Palustrine Forested Complex	4,531	9.2%
Palustrine Forested	5,567	11.3%
Estuarine	184	0.4%
Lacustrine	44	0.1%
Total Wetland	13,045	26.3%

Note: Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

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contorta). Understory shrubs and herbaceous species typically include blueberry (*Vaccinium* spp), devils club (*Oplopanax horridus*), skunk cabbage (*Lysichiton americanus*), and mosses. Soils are typically very poorly drained organic soils or poorly and very poorly drained mineral soils. Forested wetlands are often interspersed with open moss bogs or other types of wetlands as described below. They can perform most of the wetland functions described above. Many forested wetland soils are capable of growing commercial trees and are included in the suitable timber base.

Palustrine Scrub-Shrub Wetlands: Wetlands dominated by shrub species and understories consisting of mosses, sedges, and other forbs. Common shrub species are labrador tea (*Ledum groenlandicum*) and Sitka alder (*Alnus sitchensis*). Trees can be scattered, with less than 30 percent cover. Soils are typically very poorly drained organic soils or mineral soils. Scrub-shrub wetlands are typically interspersed with other types of wetlands and can perform most of the wetland functions.

Palustrine Emergent Wetlands: Bogs and fens are two types of palustrine emergent wetlands that are typically found in the watersheds in the project area. While they are found in the project area, they are not found within proposed units due to lack of merchantable timber.

Bogs: Wetlands occurring at low to high elevations that produce and accumulate organic matter at a greater rate than is decomposed. Bogs display low pH, low minerals, and low nutrients. This leads to low primary production and slow decomposition. Bogs function as areas for recharge of groundwater and streams, and for deposition and storage of sediment and nutrients. Tree cover is generally low and often stunted in growth. Common shrubs include labrador tea, crowberry (*Empetrum nigrum*), and western bog-laurel (*Kalmia microphylla* ssp. *occidentalis*). Common non-woody vegetation includes sphagnum mosses (*Sphagnum* spp.), cotton grass (*Eriophorum* spp.), and sedges (*Carex* spp.).

Fens: These wetland types are very similar to bogs, but they usually receive some drainage from surrounding mineral soil. Fens have relatively low pH, nutrients, and mineral content, but not as low as bogs. These wetlands are generally slightly minerotrophic sites where peat is formed mainly from sedges or other plants (Mitsch and Gosselink 1993). Fens can be particularly important for maintaining streams during dry periods because their discharge remains relatively consistent throughout the summer.

Lacustrine Wetlands: These wetland types include deepwater habitats associated with lakes and ponds. These areas may be partially non-vegetated (unconsolidated bottom), or may contain emergent, scrub-shrub, or forested vegetation. Common emergent vegetation includes sedges and rushes. Scrub-shrub and forested vegetation commonly includes Sitka alder (*Alnus sitchensis*). While there are lacustrine wetlands in the project area, there are not any in the proposed units.

Past Activities in the Project Area

Harvesting activities and road building began in the project area in 1979 when the log transfer facility (LTF) was developed and one unit was harvested in the Homeshore watershed. Since then, there have been units harvested in 1981, 1982, 1989, 1990, 1991, and 1992. There were a total of

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45.5 miles of roads built and 2,164 acres harvested in that 11-year period. Of the 45.5 miles of road, 35.7 miles were classified roads and 9.8 miles were temporary roads which have been closed. While most of the roads were built in upland areas, 17.2 miles (37.8 percent) were built in wetlands mapped by National Wetlands Inventory (NWI). This is approximately 50 acres. The past timber activities included harvest in 335 acres of wetlands or 15.5 percent of the harvest area. This represents less than 1.0 percent of the general project area and 4.3 percent of project area wetlands. All of the harvesting in wetlands occurred in the last 4 years of the activity, 1989 to 1992. There have been 13 to 15 years for regrowth in these wetlands.

Environmental Effects

Timber harvest and associated activities, such as road construction, maintenance, and use, can affect wetland sites. The magnitude of timber harvest-related effects to wetlands depends, in part, on the intensity, location, and duration of the road construction or timber harvest activity. The effects can include alteration of wetlands due to tree removal or road construction.

Tree harvesting on wetland sites would have short-term effects on the sites themselves and on adjacent or nearby wetlands by potentially altering hydrology, changing nutrient pathways, delivering sediment (which can diminish water quality), and reducing shading. While the hydrologic and biogeochemical functions begin to return as soon as there is tree revegetation, the habitat functions may require more time and forest regrowth to return. Revegetation of forested wetland sites is expected to occur in the same time frame as other forested sites, usually within 3 to 5 years. Timber site productivity on wetland soils, however, may be lower than on better-drained sites, and merchantable timber may require a longer time frame on wetlands than on the drier sites.

Construction of roads within wetlands permanently removes the wetland area and functions under the roadbed itself. Additionally, crossing wetlands with roads, without adequate provision for cross-drainage, can lead to sedimentation from road construction or changes in hydrologic patterns; thus, road construction would eliminate habitat in the filled area and may alter hydrologic functions.

The potential effects of forest roads on wetlands led to a study to determine whether the existing roads on the Tongass National Forest had a detrimental effect on the wetlands they crossed. It was found that the effects of the roads on the wetlands appeared to be minimal. The lack of notable effects was attributed to the high regional precipitation, the porous nature of the roadbeds, and the road construction techniques (Glaser 1998).

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Effects on wetlands from the proposed alternatives generally fall within two categories: long-term loss of wetland due to road construction fill and disturbance, and short term effects due to timber harvest. The majority of wetlands found within the unit pool are forested wetlands. Non-forested wetlands, such as bogs, sedge fens, estuaries, and alpine wetland sites, are not generally included in the proposed units because avoidance is directed by Forest Plan Standards and Guidelines. Non-forested wetlands also characteristically contain timber of low quality (non-merchantable) and low volume and are not generally included in the proposed units.

Estimated wetland acreage within the proposed harvest units ranges between 70 and 80 acres for Alternatives 2, 3, and 4. It is 44 acres for Alternative 5 and 13 acres for Alternative 6 (Table 3-60). In all alternatives, this represents far less than 1.0 percent of the project area and less than 1.0 percent of the wetlands in the project area.

The most important direct effect on wetlands in the project area would be the fill associated with road construction. The proposed Couverden Timber Sale is designed to primarily use existing roads, which were built to support past timber harvest activities. One new classified road (providing access to Unit S-39) crosses wetlands for a short distance under Alternatives 2 and 3. A road needed to reach the top of the unit could not completely avoid the wetlands outside the unit but was routed to minimize the effects on wetlands and streams.

In Alternatives 2, 3, and 4, up to 0.6 mile of classified road would be constructed on what was former temporary roadbed. These roads were built as temporary roads, closed, and are now in various stages of reforestation. New construction on these roads would have less of an effect than other new construction because little new fill material would be required.

While the specific details of routes for temporary roads are determined during harvest activities, the general route is known. The temporary roads would be built according to the BMPs contained in the Forest Plan (USDA Forest Service 1997a) to ensure that wetlands are avoided where practicable and that any wetlands crossed by temporary roads are minimally affected during harvest activities. Temporary roads are proposed for construction for access during harvest in Alternatives 2, 3, 4, and 6 (Table 3-61). Alternative 4 would affect the largest amount of wetland area with proposed temporary roads (6.1 acres), followed by Alternative 3 (4.3 acres), and Alternative 2 (3.9 acres). Alternative 6 would affect less than 1 acre of wetland with temporary roads, and Alternative 5, which does not include any road construction, would not directly affect wetlands.

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Table 3-60

Estimated Acres of Harvest on Wetlands under the Action Alternatives^{1/}

Wetland Type ^{2/}	Alternative 2			Alternative 3			Alternative 4			Alternative 5			Alternative 6		
	Total Acres	Clearcut with Reserves	Selection Harvest	Total Acres	Clearcut with Reserves	Selection Harvest	Total Acres	Clearcut with Reserves	Selection Harvest	Total Acres	Clearcut with Reserves	Selection Harvest	Total Acres	Clearcut with Reserves	Selection Harvest
PSS	11	11	0	6	5	1	5	5	0	8	0	8	1	1	0
PFO	60	55	5	71	61	10	76	70	6	36	0	36	12	12	0
Subtotal Wetland Acreage	71	66	5	77	66	11	81	75	6	44	0	44	13	13	0
Total Harvest Acreage	978	801	177	759	537	222	566	554	12	367	0	367	172	172	0

1/ National Wetland Inventory (NWI) acreage modified by survey information

2/ PSS = Palustrine Scrub-Shrub, PFO = Palustrine Forested

Note: Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

Table 3-61

Classified and Temporary Roads in Wetlands Under the Alternatives^{1/}

	Alternative				
	2	3	4	5	6
Classified Roads^{2/}					
Palustrine Forested (Unit S-39, Road 855399)	100 feet <1/4 acres	100 feet <1/4 acres	0	0	0
Classified Road Construction on Former Temporary Road Beds^{3/}					
Palustrine Forested	0.2 mile 0.6 acres	0.2 mile 0.6 acres	0.6 mile 2.0 acres	0	0
Palustrine Scrub-Shrub	0.2 mile 0.6 acres	0.2 mile 0.6 acres	0.2 mile 0.6 acres	0	0
New Temporary Roads^{3/}					
Palustrine Forested	0.7 mile 2.1 acres	0.8 mile 2.5 acres	0.9 mile 2.9 acres	0	0.07 mile 0.3 acre
Palustrine Scrub-Shrub	0.2 mile 0.6 acres	0.2 mile 0.6 acres	0.2 mile 0.6 acres	0	0

1/ Assume a 24-foot ROW

2/ Based on field survey

3/ National Wetlands Inventory

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Cumulative Effects

Due to the relatively low acreage of wetlands affected by the alternatives, significant cumulative effects on wetland resources are not anticipated from proposed project activities. Additionally, revegetation of forested wetland sites generally occurs in the same time frame as other forested sites, usually within 3 to 5 years. Consequently, long-term effects on forested wetlands are expected to be minor. Because growth rates on forested wetlands are expected to be lower than on non-wetlands forest sites, merchantable timber from these areas may not be available as early as the timber on upland sites.

Past activities in the project area included the building of 17.2 miles of road in wetlands, harvest of 335 acres in wetlands, and precommercial thinning in older harvest units in the Homeshore area. The planned future projects in the Couverden project area include installation of a small boat dock and boat ramp, road maintenance, and road use. The older units are designated as upland in the NWI data, but these areas were not reviewed in the field. No other known projects are proposed in the project area for the foreseeable future. All activities would be designed to minimize adverse effects on wetlands as directed by the Executive Order 11990 and the Forest Plan. Cumulative effects on wetlands would be proportional to the level of harvest and road building.

Under the proposed alternatives, new road construction in wetland sites would follow the BMPs listed in the mitigation section (Appendix D) to minimize disruption of water flow and avoid restricting the natural movement of water. These measures would ensure that the hydrological, chemical, and biological functions of wetlands would be minimally impaired. The roadbed overlying wetlands would remove the area from production and eliminate their biological functions. The percent loss within watersheds is displayed in Table 3-62. Cumulative effects on wetlands from road construction would be minimal due to the low acreage loss within the watersheds.

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Table 3-62
Cumulative Acres and Percent of Wetlands Harvested within Project Area Watersheds by Alternative

Watersheds and Drainages	Watershed Acres	NWI Wetland Acres ^{1/}	Cumulative Wetland Acres and Percent of Watershed Wetlands Affected by Harvest for each Alternative ^{2/}					
			Alternative					
			1 (No Action)	2	3	4	5	6
Swanson Watershed	13,375	3,166	136 4.3%	136 4.3%	136 4.3%	174 5.5%	151 4.8%	136 4.3%
North Drainage Group	3,435	210	33 15.7%	44 21.0%	39 18.6%	37 17.6%	43 20.5%	34 16.2%
South Drainage Group	8,129	3,534	103 2.9%	124 3.5%	132 3.7%	124 3.5%	127 3.6%	105 3.0%
Homesore Watershed	6,762	69	0	0	0	0	0	0
Humpy Watershed	6,183	676	63 9.3%	102 15.1%	105 15.5%	81 12.0%	95 14.1%	72 10.7%
Other Drainages	11,638	6,094	0	0	0	0	0	0
Total	49,522	13,749	335 2.4%	406 3.0%	412 3.0%	416 3.0%	416 3.0%	347 2.5%

1/ Acres of NWI wetlands within watershed.

2/ Acres of NWI wetlands affected by past and proposed timber harvest under each alternative does not include roads outside harvest units.

Note: Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

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Threatened, Endangered, and Sensitive Species

This section addresses threatened, endangered, and Alaska Region listed sensitive (TES) species that are documented or expected to occur within the project area. For each species, the analysis consists of a discussion of the affected environment, followed by an assessment of the direct and indirect effects of the six alternatives. Cumulative effects for all TES species are addressed together at the end of the chapter. Additional discussion of all species and their habitats can be found in the Resource Report for Wildlife, Watershed and Fisheries, and Sensitive Plants (Foster Wheeler Environmental 2003a, Foster Wheeler Environmental 2003c, Foster Wheeler Environmental 2003i, respectively).

Federal Threatened and Endangered Species

In accordance with Section 7(c) of the Endangered Species Act (ESA), a species list was provided by the National Marine Fisheries Service (NMFS) on December 16, 2002, identifying marine species listed under the ESA that may occur within the Couverden project area, or that may be affected by the proposed project. A similar list was requested from the U.S. Fish and Wildlife Service (USFWS), but no ESA listed species under USFWS jurisdiction occur in the vicinity of the project area. The following discussion describes the direct and indirect effects of the alternatives on species that are listed under the ESA and that are known or suspected to occur in the project area. The effects of the proposed action are addressed in more detail in the Biological Assessment for this timber sale.

Plants

No federally listed threatened or endangered plant species occur in the vicinity of the project area (USDA Forest Service 2001). Therefore, no direct or indirect effects on federally threatened plants are expected under any of the proposed alternatives.

Fish

The Lower Columbia River chinook salmon (*Oncorhynchus tshawytscha*), Upper Columbia River spring-run chinook salmon, Puget Sound chinook salmon, Upper Willamette River chinook salmon, Snake River fall-run chinook salmon, Snake River spring and summer runs of chinook salmon, Snake River sockeye salmon (*O. nerka*), and steelhead (*O. mykiss*) from the Snake River basin and the Lower, Middle, and Upper Columbia River sections are listed as threatened or endangered. These species may occur in marine waters in the Bering Sea, Aleutian Islands, and the Gulf of Alaska to the west of the Tongass National Forest, but are not known to inhabit the coastal marine waters of the Tongass National Forest. Because chinook salmon, and to a lesser extent sockeye and steelhead, are piscivores, they may, during some stage of their lives, feed on fish that may be dependent on the waters of the Tongass National Forest.

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Environmental Effects

No direct, indirect, or cumulative effects on the stocks of the Lower Columbia River chinook salmon, Upper Columbia River spring-run chinook salmon, Puget Sound chinook salmon, Upper Willamette River chinook salmon, Snake River fall-run chinook salmon, Snake River spring and summer runs of chinook salmon, Snake River sockeye salmon, and steelhead from the Snake River basin and the Lower, Middle, and Upper Columbia River sections are anticipated to result from implementation of any of the action alternatives.

All project-related activities would be conducted in a manner consistent with the ESA and Essential Fish Habitat (EFH) guidelines from National Oceanic and Atmospheric Administration (NOAA) Fisheries. Actions will also be conducted in compliance with regulations protecting fish habitat under the Tongass Land and Resource Management Plan, the Tongass Timber Reform Act, and the Alaska Department of Fish and Game (ADF&G).

Wildlife

Two federally listed wildlife species are known to occur within the boundaries of the Tongass National Forest near the project area, including the humpback whale (*Megaptera novaeangliae*) and Steller sea lion (eastern population) (*Eumetopias jubatus*). No critical habitat for these species has been designated within the Couverden project area.

Humpback Whale

Humpback whales are regularly sighted in the Inside Passage and coastal waters of the Southeast Alaska panhandle from Yakutat Bay south to Queen Charlotte Sound (USDA Forest Service 1997a, Appendix J). Humpback whales are found in coastal areas or near oceanic islands and appear to occur primarily in nearshore waters, especially the highly productive fjords of Southeast Alaska and Prince William Sound (Calkins 1986). Humpback whales are regularly sighted in the Inside Passage and coastal waters of the Southeast Alaska panhandle from Yakutat Bay south to Queen Charlotte Sound (USDA Forest Service 1997a, Appendix J). Humpbacks remain in the Gulf of Alaska through the summer and fall and begin their migration south in November, although they have been observed in Lynn Canal during each month of the year. Peak numbers of whales are usually found in nearshore waters during late August and September, but substantial numbers may remain until early winter. The Forest Service (1997a) estimates that 300 to 500 humpback whales inhabit Southeast Alaska during the summer and fall. The most recent estimate by Straley et al. (2002) indicated that the annual abundance of humpback whales in Southeast Alaska is nearly 1,000 animals.

The local distribution of humpbacks in Southeast Alaska is correlated with the density and seasonal availability of prey species, particularly herring and euphausiids (small crustaceans). Important feeding areas include Glacier Bay and the adjacent portions of Icy Strait. Whales were regularly seen just offshore from the existing log transfer facility (LTF) in the project area.

Steller Sea Lion

The Steller sea lion is widely distributed over the continental shelf and throughout the coastal waters of the Gulf of Alaska (Calkins 1986). The total estimated population of the Eastern Stock of Steller sea lions in

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Southeast Alaska based on 1998 numbers is 15,196 (10,939 non-pups plus 4,257 pups); if it is conservatively assumed that the pup count is relatively stable, the total count for 2,000 would be 16,674 (12,417 non-pups plus 4,257 pups) (NMFS 2003, NMFS 2002). The number of pups produced in the Eastern Stock has nearly doubled since 1978, with an annual rate of increase of 5.9 percent during 1979 to 1998, although the rate of increase between 1989 and 1997 was only 1.7 percent (Calkins et al. 1999). In the Southeast Alaska portion of the Eastern Stock, non-pup counts on trend sites have increased 29.3 percent since 1990 (Sease et al. 2001). The estimated abundance of the Eastern Stock population of Steller sea lions region-wide (southeast Alaska, Washington, Oregon, California, and British Columbia) is 31,028 animals (NMFS 2002). Calkins et al. (1999) suggested that there are probably more sea lions at present than at any time in recorded history.

A new rookery became established at the Hazy Islands. Pup production has also increased by approximately 33 percent on Forester Island in this same time frame (National Marine Fisheries Service 1992). More recently, White Sisters have been used for pupping. The aforementioned islands are located more than 70 miles away and well south and west of the project area; west of Chichagof, Baranof, and Dall Islands.

The nearest haulout to the Couverden project area is Benjamin Island. This haulout is approximately 30 to 35 miles northeast of the project area and located in Favorite Channel, north of Juneau. Steller sea lions have been documented foraging in the nearshore waters around the Couverden project area and were seen during the 2002 field season.

Environmental Effects

No direct, indirect, or cumulative effects on humpback whales or Steller sea lions are anticipated to result from implementation of any of the action alternatives. Forest Plan Standards and Guidelines for Threatened and Endangered Species provide for the protection and maintenance of whale and sea lion habitats. All project-related activities would be conducted in a manner consistent with the Marine Mammal Protection Act, the ESA, and NMFS regulations for approaching whales, porpoises, dolphins, sea lions, and seals.

Forest Service Sensitive Species

Forest Service Sensitive Species are defined as native plant and animal species for which population viability is a concern, as evidenced by a significant current or predicted downward trend, either in population numbers or the availability of habitat capable of supporting the existing distribution of the species. It is Forest Service policy to avoid actions that may cause sensitive species to become listed under the ESA and to maintain viable populations of these plants and animals.

Plants

The Alaska Region sensitive plant list (USDA Forest Service 2002a) includes 19 species. Of these, 12 species are known or suspected in the

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Juneau Ranger District. These are presented in Table 3-63. Most of these species typically occupy open wetlands or other habitats with low tree cover, including maritime beaches, meadows, and alpine and subalpine areas. Three species, Norberg arnica (*Arnica lessingii* ssp. *norbergii*), Wright filmy fern (*Hymenophyllum wrightii*), and Calder lovage (*Ligusticum calderi*) may occur in open forest or on forest edges. Of these, only Wright filmy fern typically occurs under a closed forest canopy.

Searches were conducted in June and July 2002 for Alaska Region sensitive listed plant species in the project area, according to established inventory protocols (USDA Forest Service 2001). Areas were prioritized for a survey based on the likelihood of habitat for the species in Table 3-63. Information on potential habitat was obtained from aerial photographs, topographic maps, and field reports of staff conducting stand exams, stream surveys, and road layouts in the area. Searches focused on proposed harvest units but also included areas with promising habitat that were within the project area but outside of proposed harvest units.

Table 3-63
Forest Service Sensitive Plant Species Known or Suspected to Occur on the Juneau Ranger District

Plant Species	Habitat
Norberg arnica (<i>Arnica lessingii</i> ssp. <i>norbergii</i>)	Tall shrubland, forest edge, open forest, dry or wet meadows, alpine and subalpine areas
Moonwort (<i>Botrychium tunux</i>)	Maritime beaches, upper beach meadow, well drained open areas
Moonwort (<i>Botrychium yaaxudakeit</i>)	Maritime beaches, upper beach meadow, well drained open areas
Goose-grass sedge (<i>Carex lenticularis</i> var. <i>dolia</i>)	Lake margins, marshy areas, shallow water, alpine and subalpine
Davy mannagrass (<i>Glyceria leptostachya</i>)	Stream sides, river banks, lake margins, marshy areas, shallow water
Wright filmy fern (<i>Hymenophyllum wrightii</i>)	Forest and forest edge
Truncate quillwort (<i>Isoetes truncata</i>)	Shallow fresh water
Calder lovage (<i>Ligusticum calderi</i>)	Forest edge, wet meadows, alpine and subalpine
Bog orchid (<i>Platanthera gracilis</i>)	Upper beach meadow, bog, heath, wet meadow, alpine and subalpine
Loose-flowered bluegrass (<i>Poa laxiflora</i>)	Maritime beaches, upper beach meadow
Kamchatka alkali grass (<i>Puccinellia kamischatica</i>)	Maritime beaches, upper beach meadow
Unalaska mist-maid (<i>Romanzoffia unalaschcensis</i>)	Forest edge, alpine and subalpine, rock outcrop

Source: USDA Forest Service 2002

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No Alaska Region sensitive listed plant species were detected during the field surveys conducted for the project (Foster Wheeler Environmental 2003j).

Environmental Effects

There are no known occurrences of sensitive plant species in the project area. No sensitive plant species were located during surveys (Foster Wheeler Environmental 2003i). Consequently, direct or indirect effects to sensitive plant species are not likely to occur as a result of any of the proposed alternatives.

Wildlife

Four wildlife species on the Regional Forester's sensitive species list may occur in the project area, including Peale's peregrine falcon (*Falco peregrinus pealei*), Queen Charlotte (northern) goshawk (*Accipiter gentilis laingi*), trumpeter swan (*Cygnus buccinator*), and osprey (*Pandion haliaetus*). The following sections address these species and their potential to be affected by the six alternatives.

Peale's Peregrine Falcon

The Peale's peregrine falcon (*Falco peregrinus pealei*) is a subspecies of the peregrine falcon, which was removed from the federal endangered species list (delisted) on August 25, 1999 (50 CFR, Part 17). Peale's peregrine falcon is typically darker in plumage and ranges from the northwest coast to the Aleutian Islands (National Geographic Society 1992). Actual migration routes and nesting and/or foraging areas of peregrine falcons have not been identified within the project area to date. The peregrine falcon potentially passes through the region on spring and fall migration flights, but is not known to nest or forage in the project area, but no site-specific surveys have been conducted.

As of 1997, 36 Peale's peregrine falcon nests have been located in Southeast Alaska, 32 of which are on the Tongass National Forest. Nest surveys are very difficult to conduct, and biologists believe more nests may be present. However, no intensive nest surveys have been conducted recently. Peregrine falcon nest distribution is closely associated with large seabird colonies located on the outer coasts or nearby islands. The nest sites are on cliffs from 65 to 900 feet in height and all but one face the open ocean. Seabirds are thought to be major prey of the falcon. Information on falcon breeding biology or reproductive success is limited, but based on USFWS surveys, populations appear to be stable.

Environmental Effects

No direct or indirect effects are anticipated for Peale's peregrine falcons. No suitable cliff habitat occurs along the project boundary and no large seabird colonies are documented in the immediate area of the project. No peregrine nest sites have been documented, nor have any observations been reported within the project area. Therefore, no project-related activities are anticipated to directly or indirectly affect this species.

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Queen Charlotte (Northern) Goshawk

The northern goshawk (*Accipiter gentilis laingi*) inhabits forested lands throughout North America, favoring dense stands of conifer or deciduous old-growth forest for nesting habitat (USDA Forest Service 1997a). The Queen Charlotte goshawk is recognized as a distinct subspecies found only in the coastal areas of British Columbia and Southeast Alaska. Eighty-one percent of the confirmed and probable nest sites of this subspecies in Southeast Alaska are south of Frederick Sound (USDA Forest Service 1991). In Southeast Alaska, the goshawk appears to be non-migratory, although it may occupy different or overlapping breeding and winter territories (USDA Forest Service 1997a).

Productive old-growth forest is an important component of goshawk habitat use patterns. Radio-marked goshawks consistently select this forest habitat type, relative to availability, with 68 percent of all relocations occurring in productive old-growth forest. Most other habitat types (such as alpine, subalpine, peatland [muskeg], and clearcuts) were used infrequently or avoided by goshawks. Timber harvesting in the Tongass (and on private lands in Southeast Alaska) results in the conversion of old-growth forest (a selected habitat type), to young-growth forest (an avoided habitat type), and thus suggests decline in goshawk habitat capability.

Forest Service personnel conducted goshawk surveys according to current inventory protocols in 2000 and 2002. Valley Watch surveys occurred in April 2002 and point sampling was conducted in July 2000 and 2002 on 117 calling stations. Although no goshawks were detected, a possible sighting was noted in 2000, but it was not confirmed. No detections were made in 2002.

Landscape factors, such as slope and elevation, along with beaches, riparian, and estuaries, are important to goshawk habitat suitability. Goshawks appear to prefer elevations lower than 800 feet and slopes less than 35 percent (Iverson et al. 1996). Riparian zones ranked as the most important landscape component used by radio-collared goshawks (Iverson et al. 1996). Radio-tracking results also indicated that goshawks make extensive use of areas within 1,000 feet of beaches and estuaries (Titus et al. 1994). Beach, estuary, and riparian habitats generally support greater prey diversity and net prey productivity, both of which are important to goshawk habitat quality (USDA Forest Service 1997b).

Environmental Effects

The Forest Plan has specific protective standards and guidelines to address goshawk habitat in VCUs where more than 33 percent of the productive old-growth forest has been harvested. The Couverden project area has had a 9 percent reduction due to past harvest. There are no known nest sites or confirmed sitings of goshawks within the project area. All action alternatives would harvest stands capable of providing nesting and/or foraging habitat for goshawks. Although all medium- and high-volume old-growth habitat was analyzed as potential goshawk habitat, comparisons were made for these habitats below 800 feet in elevation. Loss of high probability goshawk nesting habitat associated with the alternatives would range from 316 acres (3.6 percent) in Alternative 2 to 85 acres (1 percent) in Alternative 6 (Table 3-64). Significant direct effects due to habitat loss are not anticipated for goshawks because the amount of suitable habitat being removed under all

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Table 3-64

Amount of Medium- and High-volume Productive Old-growth (POG) Acres Only and (Percent of Total POG) by Elevation and Alternative within the 49,522-acre Couverden Project Area^{1/}

Elevation Class	Existing Med-High-volume POG	Alternative				
		2	3	4	5	6
<800	8,683 (52%)	316 (3.6%)	289 (3.3%)	150 (1.7%)	96 (1.1%)	85 (1.0%)
800-1,500	5,730 (34%)	399 (7.0%)	274 (4.8%)	241 (4.2%)	64 (1.1%)	77 (1.3%)
>1,500	2,341 (14%)	135 (5.8%)	74 (3.2%)	18 (0.8%)	70 (3.0%)	0 (0%)
Total	16,754 (100 %)	850 (5.1%)	637 (3.8%)	409 (2.4%)	230 (1.4%)	162 (1.0%)

^{1/} Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

action alternatives would be less than 4 percent of the existing suitable medium- and high-volume old-growth within the project area.

Indirect losses associated with fragmentation of relatively contiguous old-growth areas and temporary and permanent disturbance of potential nest sites due to road construction and maintenance are the primary effects on goshawks. Based on patch size and assessment of existing interior forest analyses, Alternative 2 would have the greatest decrease in the number of contiguous medium- and high-volume old-growth patches with a 12 percent reduction in the amount of interior forest, followed by Alternatives 3, 4, 5, and 6, with 8 percent, 5 percent, 4 percent, and 2 percent, respectively (see Table 3-8 in the *Wildlife* section).

Trumpeter Swan

Trumpeter swans (*Cygnus buccinator*) that breed in Alaska spend the winter along the Pacific Coast from the Alaska Peninsula south to the mouth of the Columbia River between Washington and Oregon. Suitable nesting habitat is classified as wetlands and/or riparian habitat. There have been no records of swans in the Couverden project area during winter swan surveys conducted by the USFWS (Conant et al. 2001).

Environmental Effects

No direct or indirect effects are anticipated for the trumpeter swan. All alternatives fully incorporate Forest Plan Standards and Guidelines for trumpeter swans. These prohibit disturbance of trumpeter swans during the nesting, brood rearing, and wintering periods. If trumpeter swans are observed using habitats within the project area, road building and timber harvesting would not be permitted within 0.5 mile of these habitats when swans are present (usually from November 1 to April 1). Therefore, no project-related activities are anticipated to directly or indirectly affect this species.

Osprey

The best available information indicates that the osprey (*Pandion haliaetus*) is naturally rare in Southeast Alaska, which may represent the periphery of the species' range. A total of 16 osprey nest sites have been documented in Southeast Alaska (USDA Forest Service 1997a). Of this total, no more than three have ever been known to be active in any one year. Nest locations include Thomas Bay, Wrangell Narrows near Finger Point, near the mouth of McCormick Creek on Wrangell Island, on the Duncan Canal Tidal Flats,

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and Douglas Bay (both on Kupreanof Island). Ospreys have been observed at Towers Arm, Irish Lakes, and Kah Sheets Creek on Kupreanof Island and on Swan Lake on the mainland near Thomas Bay. Ospreys nest from late April through August and probably over-winter in Mexico and Central America. Historically, there is no evidence that there were more ospreys in Southeast Alaska (USDA Forest Service 1997a). The population numbers have remained stable but low. Limiting factors are unknown, but available nest sites and foraging areas do not appear to be limiting. Interaction and competition with the abundant bald eagle population may be a limiting factor. Also, this is the northernmost portion of the osprey's known range. No individuals or nests were observed during past fieldwork or during the 2002 fieldwork.

Environmental Effects

No direct or indirect effects are anticipated for osprey. No osprey nests sites have been documented, nor have any observations been reported within the project area; therefore, no project-related activities are anticipated to directly or indirectly affect this species.

The Forest Plan Standards and Guidelines maintain buffers along shorelines, estuaries, and around all Class I and II streams. The standards and guidelines also maintain buffers around all known nest sites, so if a nest is located during project implementation, these sites would be protected. Therefore, effects on the habitat of osprey and other raptors would be minimized under all alternatives. As with any raptor nest, disturbance could occur from helicopter logging or transportation of crews and equipment by helicopter to various areas. Timing restrictions on flight paths may be necessary.

Cumulative Effects

The cumulative effects of the Couverden Timber Sale include the effects of this proposed timber harvest and other past, present, and reasonable foreseeable future actions. Actions considered include previous timber harvest activities, associated road construction, and the construction of an existing LTF; foreseeable actions by the Forest Service include road maintenance and pre-commercial thinning in the Homeshore watershed; and foreseeable actions on overselected lands within the project area. The primary area of study for the cumulative effects analysis is within the boundary of the proposed sale area and adjacent waters.

Under all alternatives, no cumulative effects are anticipated for the federally endangered humpback whale, Upper Columbia River spring-run chinook salmon, Snake River sockeye salmon, and the Upper Columbia River steelhead, or federally threatened Steller sea lion, Lower Columbia River chinook salmon, Puget Sound chinook salmon, Upper Willamette River chinook salmon, Snake River fall-run chinook salmon, Snake River spring/summer-runs chinook salmon, Snake River basin steelhead, Lower Columbia River steelhead, and Middle Columbia River steelhead. No direct or indirect effects, and thus no cumulative effects, are anticipated for the following Forest Service sensitive species: Peale's peregrine falcon, trumpeter swan, and osprey.

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Combined with previous timber harvest, implementation of the current project would result in a cumulative reduction in the historical amount of high-value goshawk habitat, ranging from 85 acres (1.0 percent) in Alternative 6 to 316 acres (3.6 percent) in Alternative 2. However, this would not affect goshawks because there are no known goshawk nests or confirmed sightings of goshawks in the project area. As noted in the *Wildlife* section (Cumulative Effects on Wildlife Habitats and Species), past logging in the project area has reduced the amount of productive old-growth forests by approximately 2,163 acres (9 percent). Additional reductions to productive old growth under the action alternatives would range from 171 acres (1 percent) under Alternative 6 to 947 acres (4 percent) under Alternative 2. Pre-commercial thinning in older units in the Homeshore watershed in 2004 did not adversely affect goshawk habitat. No foreseeable actions are expected on overselected lands at this time. Foreseeable actions on National Forest System land, including road maintenance, are not expected to add to cumulative effects on threatened, endangered, or sensitive species or their habitat.

Socioeconomics

Affected Environment

The following discussion and analysis tiers to the detailed socioeconomic information and analysis presented in Chapter 3 of the Roadless Area Evaluation for Wilderness Recommendations Final Supplemental EIS (USDA Forest Service 2003). Additional information is also available in the Social and Economic Resource Report prepared for this project (Foster Wheeler Environmental 2003k).

The primary social and economic area of influence, or study area, for this analysis includes those communities located in close proximity to the project area and communities whose residents use the project area for subsistence and/or recreation activities. It also includes communities with economic activities that could be affected by the proposed timber sale, primarily wood products operations who could use the timber from the project area and recreation and tourism businesses. The communities that fall into one or more of these categories are Excursion Inlet, Gustavus, Hoonah, Haines, and Juneau.

This area of influence or study area includes areas in three Boroughs/Census Areas: Haines Borough, Skagway-Hoonah-Angoon Census Area (CA), and the City and Borough of Juneau. The Couverden project area, Excursion Inlet, and Haines are located in Haines Borough; Gustavus and Hoonah are located in the Skagway-Hoonah-Angoon CA; and Juneau is its own city/borough.

Southeast Alaska may also be considered a secondary region of social and economic influence. The potential effects of the proposed timber sale also extend beyond Southeast Alaska. Other areas with industries and employees that could be potentially affected include, in part, the entire state of Alaska; other western states, especially Washington, Oregon, and California; western Canadian provinces, especially British Columbia; and other Pacific Rim countries, particularly Japan. Due to the relatively small harvest volume proposed for the Couverden project area in relation to these large market areas, the following discussion focuses on Southeast Alaska and the study area identified in the preceding paragraph.

The following affected environment discussion is divided into three main parts: population, personal income, and quality of life.

Population

Approximately 74,000 people live in the towns, communities, and villages of Alaska's southeastern panhandle, most of which are located on islands or along the narrow coastal strip. Approximately 40 percent live in Juneau. Only four of Southeast Alaska's 32 communities met the U.S. Census Bureau's definition of urban (population greater than 2,500) in 2000.

The population of Southeast Alaska grew at a slower rate than the state as a whole during the 1990s, with an overall increase of 6 percent compared to a statewide average increase of 14 percent. Population increases in Haines Borough and Juneau were close to the statewide average, 13 and

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15 percent, respectively. The combined population in Skagway-Hoonah-Angoon CA and Yakutat Borough, in contrast, declined by 4 percent.

Southeast Alaska and the state of Alaska as a whole experienced net out-migration in the 1990s, with more people leaving than moving to the region (U.S. Census Bureau 2000). Net population gains in the region were primarily due to natural increase, the number of births exceeding the number of deaths. Haines and Juneau were the only boroughs/CAs in Southeast Alaska that saw net in-migration over this period. Fourteen of Alaska's 32 communities with a state land selection base experienced net decreases in population over this period. Population increased in the remaining 18 communities, including those located in the vicinity of the Couverden project area (USDA Forest Service 2003).

The population of Haines Borough grew during the 1990s despite job losses in fish and timber processing in the 1970s, primarily because the region's beauty, wildlife, and strong community draws a large number of artists, retirees, and others. The city of Haines is a major regional transportation hub, with a year-round deep-water port and road access to Canada and Interior Alaska. The population in the city of Haines increased from 1,238 in 1990 to 1,811 in 2000, an increase of 46 percent.

The Skagway-Hoonah-Angoon CA consists of 13 scattered, mostly coastal, communities, including Gustavus and Hoonah. Employment declined in many of these communities due to downturns in commercial fishing, fish processing, and export timber markets. This is reflected in the overall decrease in population in the area in the 1990s. Population in Gustavus and Hoonah, in contrast, increased between 1990 and 2000, with respective gains of 66 percent (171 people) and 8 percent (65 people).

Juneau, which is the state capital and a regional trade center, accounted for 47 percent of Southeast Alaska's total population in 2000 (Alaska Department of Labor [DOL] 2001). The population in the city/borough of Juneau increased from 26,751 in 1990 to 30,711 in 2000, an increase of 15 percent.

Race and Ethnicity

Approximately 68 percent of Alaska's population identified themselves as White in the 2000 census (Alaska DOL 2001). American Indians and Alaska Natives comprised the largest minority group, accounting for 15 percent of statewide population. People identifying themselves as White comprised 83 and 75 percent of the population of Haines Borough and the city/borough of Juneau, respectively. The population of the Skagway-Hoonah-Angoon CA was more diverse with people identifying themselves as White accounting for 58 percent of the population, American Indians and Alaska Natives accounting for 35 percent, and people identifying two or more races making up 2 percent.

With the exception of Hoonah, the potentially affected communities have populations that are predominantly White, with the proportion of the population identifying themselves as White exceeding the regional and state average. Hoonah, located on Port Frederick on the northeast shore of Chichagof Island is a predominantly Native community that has been the principal village for the Hoonah Tlingit Clans since the late 1800s. Persons

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identifying as American Indian and Alaska Native comprised approximately 61 percent of Hoonah's 2000 population, with people identifying two or more races making up an additional 10 percent (Alaska DOL 2001).

Personal Income

Per capita personal income in Southeast Alaska was \$31,243 in 2000, slightly higher than the statewide and national averages of \$29,642 and \$29,469, respectively. Per capita personal income is a summary income measure calculated by dividing total income for an area by the population of that area. Per capita income was higher than the regional average in Juneau in 2000, \$34,230 compared to \$31,243. The other study area communities had per capita incomes below the regional average, ranging from \$16,097 in Hoonah to \$22,505 in Haines.

Employment in Southeast Alaska and the study area communities is briefly discussed under Issue 3: Timber Sale Economics. Average annual earnings per job were approximately \$30,995 in Southeast Alaska in 2001. Average annual earnings in the recreation, wood products, and mining sectors were \$20,757, \$44,330, and \$68,288 in 2001, respectively (USDA Forest Service 2003). Much of the job creation that occurred in the region over the past decade was in the lower paid retail and service sectors, resulting in a steady erosion in average earnings per job and the contribution of job-related earnings to per capita income. Per capita income stayed relatively constant over this period, primarily due to increases in non-job related earnings per capita.

The unemployment rate in Southeast Alaska was 7 percent in 2000, compared to statewide and national averages of 6.6 percent and 4 percent, respectively. Unemployment rates in the study area communities in 2000 ranged from 5 percent in Juneau to 50 percent in Excursion Inlet. The unemployment rates in Hoonah, Gustavus, and Haines were 21, 14, and 14 percent, respectively. The percent of households below the poverty line in 2000 ranged from 4 percent in Juneau to 25 percent in Excursion Inlet. The percent of households below the poverty line in Hoonah, Gustavus, and Haines were 14, 10, and 16 percent, respectively (Foster Wheeler Environmental 2003k).

Quality of Life

Alaska has always been known for its unique scenery and natural resources. A recent survey of residents in 17 Alaskan communities, including 5 communities in Southeast Alaska, found that the most important factors contributing to the quality of life in Alaska are associated with the natural environment (Brown 1999). Natural elements, clean air and water, the beauty of surrounding areas, and open, undeveloped areas, were important to all the communities in the study and were consistently rated as more important than human-centered quality of life elements. The study also found that public lands surrounding Alaskan communities play an important role in the quality of life of those communities.

A number of different factors have the potential to contribute to the quality of life of local residents and visitors to the project area and surrounding vicinity. These include subsistence and recreation and tourism activities, as well as traditional areas, scenery, and the other natural qualities associated with an

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area. These resources are discussed in their respective sections in this document.

Environmental Effects

Population

The Couverden Timber Sale is not expected to have any notable effect on population in the region or the study area communities. The proposed timber sale is part of the ongoing timber sale program on the Tongass National Forest. Timber from this sale would contribute to ongoing employment in the wood products industry.

Employment and Income

The potential effects of the proposed alternatives on employment and income are presented in Issue 3: Timber Sale Economics. Direct employment and income effects are expected to range from 26 job-years and \$1,178,000 under Alternative 6 to 143 job-years and \$6,389,000 under Alternative 2.

Quality of Life

Potential effects on subsistence, recreation and tourism, visual resources, and traditional areas and special places, along with effects on local and regional employment, all have the potential to affect the quality of life of local residents and visitors to the project area. These potential effects are discussed in their respective sections and briefly summarized below.

None of the proposed alternatives would adversely affect the abundance and distribution of subsistence resources. The alternatives are also unlikely to affect subsistence use in the non-roaded portion of the project area, but could adversely affect subsistence uses of the roaded portion of the project area through short-term restrictions on access while logging is taking place. In addition, the logistical support base/camp established in the project area would likely result in a short-term increase in competition for resources under all action alternatives. These effects would generally increase with the amount of timber harvested, but could be more affected by project implementation with respect to the size and timing of sale activities. These potential effects are discussed in more detail in the *Subsistence* section.

Some outfitter/guides contacted as part of this project felt that timber harvest would have little effect on their operations. Others identified potential short- and long-term effects. Harvest activities could affect use of the existing road system for guided bicycle trips in the short term. In the long term, additional harvest could increase pressure on existing resources and competition between different groups of sports hunters, as well as between recreation and subsistence users. Additional harvest in the project area, particularly clearcuts with reserves, could have negative effects on tourists and other visitors flying from Juneau to Glacier Bay. These potential effects are discussed in more detail in the *Recreation* section.

The amount of land proposed for harvest or roading that would be visible would generally be greatest under Alternative 2 and lowest under Alternative 5. The proposed action alternatives all include mitigation techniques to meet or exceed Visual Quality Objectives in harvest and roaded areas that would be visible from key viewing areas (KVAs) and/or visual priority routes. This is discussed in the *Scenery* section.

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Documented Tlingit use of places in or near the project area, including sites along the south coast indicates traditional use of the area well into the twentieth century. Traditional practitioners among the Tlingit people living in Hoonah reportedly maintain strong connections with specific locations and general areas along coastal portions of the project area. None of the proposed alternatives would affect any known heritage resources. Past use of the area by Tlingit people from Hoonah may, however, include currently undocumented traditional heritage practices. The Forest Service would monitor known, significant resources, as well as monitor for and record previously unknown sites, if any are located. This is discussed in more detail in the *Heritage Resources* section.

Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires each federal agency to make the achievement of environmental justice part of its mission by identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low income populations. The order further stipulates that the agencies conduct their programs and activities in a manner that does not have the effect of excluding persons from participation in, denying persons the benefits of, or subjecting persons to discrimination because of their race, color, or national origin.

All of the potentially affected communities, with the exception of Juneau, could be considered low-income communities because they have per capita incomes below the regional average and higher unemployment rates. It should, however, be noted that the regional averages are heavily influenced by Juneau, which accounts for 47 percent of the region's population. With the exception of Hoonah, the potentially affected communities have populations that are predominantly White, with the proportion of the population identifying themselves as White exceeding the regional and state average. Hoonah, with American Indians and Alaska Natives and other minority groups accounting for more than 70 percent of the community's population, may be considered a minority community.

The proposed project is not expected to have disproportionately high effects on residents of these communities. The main impact of the project would be its contribution to ongoing employment in the wood products sector as part of the Forest Service's timber sale program. The distribution of this employment would depend to a large extent on the sale purchaser and may also be affected by sale implementation, specifically the decision to offer one sale or a number of different sales.

The potential effects of the proposed alternatives on factors affecting the quality of life of local residents and visitors to the region, including subsistence, are discussed in the preceding section. These effects are not expected to be disproportionately high for low income or minority populations.

Project-specific public scoping included a mailing to over 300 individuals, organizations, and government agencies seeking public comment on the proposed timber sale. Notification of the public scoping period was published in the Juneau Empire on August 1, 2002. Public scoping

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meetings were also held in August 2002 to gather public comment. Meetings were held at Juneau (August 26), Hoonah (August 27), and Gustavus (August 28). The Juneau District Ranger and other Forest Service staff also met with Hoonah Indian Association (HIA) representatives to discuss the proposed timber sales on August 27, 2002.

Cumulative Effects

The proposed timber sale is part of the Forest Service's timber sale program and is intended in combination with other past, present, and reasonably foreseeable timber sale projects in the region to provide a continued flow of timber to regional timber processors. The Record of Decision (ROD) for the 1997 Forest Plan, which this document is tiered to, found that the risk of disproportionate effects on minority or low-income populations from the Forest Plan is low (USDA Forest Service 1997a). The potential effects of the current forest plan, which may be considered cumulative effects for the purpose of this analysis, on other resources are discussed in detail in the 1997 Forest Plan Final EIS (USDA Forest Service 1997b). Cumulative effects associated with subsistence, recreation and tourism, scenery, and heritage resources are discussed in their respective sections.

Subsistence

Affected Environment

The following discussion and analysis relies on the information and analysis contained in the 1997 Tongass Forest Plan FEIS (Chapter 3: “Subsistence” and “Communities”; Appendix H: “Additional Community Information”; and the Deer Harvest Map) and the Subsistence Resource Report prepared specifically for this project (Foster Wheeler Environmental 2003d).

Section 810 of Alaska National Interest Lands Conservation Act (ANILCA) requires a federal agency having jurisdiction over public lands in Alaska to analyze the potential effects of proposed land-use activities on subsistence uses and needs, and to include a finding on whether the proposed action may significantly restrict subsistence uses.

The following discussion and analysis focuses on those food-related resources most likely to be affected by the proposed alternatives.

Subsistence Resources and Uses in the Couverden Project Area

The Couverden project area receives relatively little use for subsistence activities when measured in terms of harvest and compared to the total land use pattern for the residents of Excursion Inlet, Gustavus, and Hoonah. Terrestrial resource levels are reported to be relatively sparse, except for black bear. Fish are harvested in marine waters bordering the project area, but the streams within the project area are not documented as being used for subsistence harvest. No subsistence salmon permits have been issued for project area streams, and only a few recreational fishermen have been reported as fishing inland lakes and streams (Foster Wheeler Environmental 2003d). Subsistence use information for Excursion Inlet, the community closest to the project area, is quite sparse. The harvest for deer is the best documented, and indicates that for the period 1987 through 2002, at most, 21 percent of the community’s documented deer harvest is from the project area (Foster Wheeler Environmental 2003d, Table 2-1). No other hunting or trapping activity is documented for residents of Excursion Inlet within the project area. It is likely that they collect berries and may cut wood within the project area, and fish offshore from the Homeshore area.

The project area is peripheral to the general subsistence land use pattern for Gustavus residents, with the exception of fishing marine waters off the Homeshore area and some residents who may make an annual berry-picking trip to the project area.

While the project area is less peripheral for Hoonah residents, documented use for such resources as deer, bear, and moose is still very low relative to the total community harvest taken elsewhere. Hoonah residents also fish marine waters off the Homeshore area and collect berries and other plants in the project area. Some Hoonah residents also maintain a cultural connection to the project area, as their ancestors lived in that area, and

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members of at least one family continue to think of the Excursion Inlet area as a primary subsistence use area (Foster Wheeler Environmental 2003d).

Four goats were harvested in the project area between 1986 and 2003. The three goats taken in 2001 were harvested by non-Alaskan residents. The one goat harvested in 2003 was taken by a resident of Gustavus, and represents the total goat harvest for Gustavus for 2003. The Couverden project area roads are used by hunters to access goat hunting areas further inland, but recent harvest has been primarily by non-subsistence hunters.

Four brown bears were taken in the project area between 1981 and 2002. Subsistence hunters from Hoonah took single bears in 1993 and 2002. Sport hunters took single bears in 1998 and 2002.

Sixteen moose were taken in the project area between 1983 and 2003, primarily from coastal areas or along more interior logging roads. All documented harvest has occurred since 1994. Five moose were taken by non-subsistence hunters from Juneau. Nine of the eleven moose taken by subsistence hunters were harvested by Hoonah residents. Moose have been reported to be increasing in the project area and may be increasingly hunted by residents of Hoonah (and other communities) who stay at a seasonal camp near the log transfer facility (LTF). Prior to 2003, the documented annual harvest of moose from the project area was never greater than one. In 2003 it was five, primarily or solely by users of the seasonal camp (Foster Wheeler Environmental 2003d). Whether this will continue as a trend is uncertain, but would appear probable if Hoonah residents continue to maintain the seasonal (fall) camp near the LTF.

Although the Excursion Inlet-Couverden area was historically a productive trapping area, relatively little trapping currently takes place there. The harvest for the period 1980 to 2001 consisted of 10 wolves, 13 beaver, 1 wolverine, 148 marten, and 14 otter. Residents of Juneau (non-subsistence hunters) accounted for most of this harvest. Either no harvest took place in 2002 to 2003 or that information is not yet available.

Black bear harvest averaged 11 animals annually (1981 to 2003), with 84 percent of the harvest taken by non-subsistence hunters (about 60 percent of them from Juneau). The subsistence average annual harvest of 1 to 2 animals, taken primarily by Hoonah residents, comprised only a small part of that community's total subsistence harvest (Foster Wheeler Environmental 2003d). As with moose, however, this harvest could be increasing in conjunction with the seasonal camp near the LTF that has recently been conducted by Hoonah residents. For years prior to 2002 Hoonah residents harvested, on average, five black bears from the project area each fall (1 bear every 2 years)—about 23 percent of their total fall black bear harvest of 2.2 animals. In the fall of 2002 they harvested six black bears from the project area and in the fall of 2003 they harvested four. This not only represented 63 percent of the total fall black bear harvest for Hoonah hunters, but was also a large increase in community black bear harvest in absolute terms. Whether this will continue as a trend is uncertain, but would appear probable if Hoonah residents continue to maintain the seasonal (fall) camp near the LTF.

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The documented deer harvest from the project area is very low—a total of 69 for the period of 1987 to 2002, with 40 of these animals taken by Juneau residents (non-subsistence hunters). The last documented deer harvest from the project area is for 1993. Based on the above harvest numbers within this 16-year period, subsistence deer harvest was 1.8 deer per year, with the overall reported harvest of 4.3 deer during this period. There is no reported deer harvest in this area by Hoonah residents, although interviews conducted for the project indicated that at least one active Hoonah hunter used the Excursion Inlet area as his primary hunting territory (Foster Wheeler Environmental 2003d). This suggests that deer harvest in the project area may not be fully documented. However, even if this harvest was fully documented, it would represent very little of the overall subsistence deer harvest for any community, other than perhaps for Excursion Inlet (Foster Wheeler Environmental 2003d, Table 3-4).

Environmental Effects

Three factors related to subsistence uses are specifically identified by ANILCA, including 1) resource distribution and abundance, 2) access to resources, and 3) competition for the use of resources. The analysis summarized in the following sections addresses the effects of the proposed alternatives on each of these factors. The analysis also considered the availability of subsistence resources in the surrounding area, the cumulative effects of past and reasonably foreseeable future timber harvest activities, and the documented use patterns of subsistence resource users (Foster Wheeler Environmental 2003d).

The effects of the proposed alternatives on resource distribution and abundance are also discussed in the *Wildlife* and *Watershed and Fisheries* sections of this document.

Abundance and Distribution

The Couverden Wildlife Resource Report analysis indicates that there are no significant habitat degradation effects upon wildlife resources under any of the alternatives (Foster Wheeler Environmental 2002). Therefore, none of the proposed alternatives are expected to have significant effects upon the abundance and distribution of subsistence resources.

The 1997 Tongass Forest Plan FEIS indicates that implementation of the Forest Plan would not result in a decrease in deer habitat capability for Wildlife Analysis Area (WAA) 2305 or WAA 2306 in 2095 compared to that existing in 1954 (USDA Forest Service 1997a). Changes in the percent of “high value winter deer range” are very similar to changes in overall deer habitat capability (USDA Forest Service 1997b). Both WAAs (i.e., 2305 and 2306) are estimated to have habitat that would support deer density of about 21.5 deer per square mile, which would be reduced to 21.2 deer per square mile for Alternative 2 (Issue 2, Wildlife Habitat) available for wolves. However, to assess the impacts to deer available for hunting, in addition to wolf predation, the deer model used a 36 percent reduction in calculated HSI values, which estimated a current habitat capability of 1,437 deer or 11.6 deer per square mile within the analysis area. As discussed under Issue 2, Wildlife Habitat section, the winter deer habitat capability model output is not

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an actual population number, but it is a theoretical long-term carrying capacity for the habitat in the area given normal winter conditions. The number is useful for purposes of comparing potential impacts to habitat capability among timber harvest alternatives; they do not reflect actual, known numbers of deer across this landscape.

Using the 36 percent reduction to assess potential impacts to deer from hunting resulted in an estimated deer density per square mile, ranging from 11.5 deer per square mile under Alternatives 4, 5, and 6 to 11.4 deer per square mile under Alternatives 2 and 3 (Table 3-65). However, based on the current level of deer high value habitat, and subsistence and non-subsistence hunting documented within the project area, even the reduced long-term carrying capacity should not have a significant restriction on the current pattern of subsistence uses in the project area, because deer abundance and distribution is not the primary reason why current users of the project area choose to go there.

Based on the total number of deer harvested between 1987 and 2002, approximately 2 percent and 4.8 percent of the estimated number of deer available to support hunter harvest (i.e., 1,437 deer) were taken for subsistence and non-subsistence hunters, respectively. Most resource managers agree that a deer population at carrying capacity should be able to support a hunter harvest of approximately 10 percent, which is sustainable and provides a reasonably high level of hunter success (USDA Forest Service 1997, p. 3-596).

Access to Resources

Access to subsistence resources in the Couverden project area is by boat. Some users ferry off-highway vehicles (OHVs) to the project area, others hunt on foot. Some hunters may use the project area in both ways, but the majority of users seem to mainly do one or the other. Alternatives that increase the road network could favor one method and potentially disadvantage the other. However, all of the proposed roads are short extensions of existing roads and cannot be considered to disadvantage those hunters who choose to use only non-roaded areas. The proposed roads may increase access for hunters who choose to use roads to access resources because the roads, which would be closed to most motorized

Table 3-65
Habitat Capability for Sitka Black-tailed Deer Using a 36 Percent Reduction Factor to Assess Impacts to Deer Available for Hunting, in Addition to Wolf Predation for WAAs 2305 and 2306

	By Alternative					
	1	2	3	4	5	6
Number of Deer	1,437	1,416	1,420	1,426	1,432	1,432
Percent Decrease	---	1.5%	1.2%	0.8%	0.4%	0.4%
Number of Deer/ mi ²	11.6	11.4	11.4	11.5	11.5	11.5

Source: Deer Model Output, using 100 deer per square mile as maximum long-term carrying capacity.

Note: Deer/mi² = deer per square mile

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vehicles, would typically be passable on foot and on OHVs. Roads would be closed at the first practical point, either by tank trap at the beginning of the road, at the first stream crossing, or by official closure order.

The type of timber harvest proposed (clearcut with reserves or single tree selection and group selection) could also affect access. Subsistence hunters differ on the effects of clearcuts on hunting success. Some say that for some years after timber harvest clearcuts are quite productive, while others prefer not to use clearcuts. All agree that after a period of time clearcuts in the process of regrowth become impassable to hunters. There is not sufficient information on the use preferences of Hoonah subsistence users to determine whether clearcuts in the Couverden project area represent an adverse effect in terms of access. If they do, Alternative 5, which stipulates selective harvests for all units, would be the only alternative without such effects.

Any improvement in the LTF, especially the installation of a seasonal dock, would increase access to the project area. At present, people either anchor their boats offshore or pull them up on the beach. All of the action alternatives use the existing LTF and would, therefore, have the same effect on access.

Subsistence users who choose to access the project area by roads would be affected during logging activities, because it is standard policy to close logging roads and active LTFs to outside traffic when logging is taking place due to safety concerns. Those Hoonah users who camp near the LTF during moose season would be especially affected. These effects are likely to vary based on sale implementation, with relatively small scale offerings over a long period of time having less effect than large offerings that are required to be harvested in a short period of time. Allowing for public access to an active LTF should be easier if the LTF is less rather than more active. Similarly, the fewer units being actively harvested and the fewer logging trucks transporting logs, the more likely it is that at least portions of the road network could be kept open to the public. If the LTF and roads remain open to the public when active logging is taking place, potential effects will depend on the public perception of the attractiveness and safety of the use of the project area under such conditions. Most of the local users interviewed for the project expressed concerns about using logging roads for hunting access or other recreational uses if active logging were taking place in the area.

Subsistence use could also be affected by increased traffic (including boat and barge traffic) and by loggers who establish a camp near the LTF. Increased barge and boat traffic could interfere with salmon trolling in the Homeshore area. Hoonah hunters who camp near the LTF in the fall would be especially affected by log truck traffic. On the other hand, improvements in the LTF may also facilitate access for subsistence users to their seasonal camp near the LTF in the long term.

These types of potential effects are likely to vary by alternative based on the volume of timber to be logged in any given period of time. Alternative 5 would have the least effect, followed by Alternatives 6, 4, and 3 in increasing

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order. Alternative 2 would have the greatest effect. The implementation of sales (especially in terms of size of offerings and timing) will also affect the magnitude of potential adverse effects. Small sales, such as proposed under Alternative 5, could more easily be scheduled at times that would not conflict with seasonal use by subsistence hunters.

Competitive Effects

Additional roads are not likely to increase access and competition in the Couverden project area. Few people travel to the area for subsistence hunting and only short additions to the existing road system are proposed. These additions would be closed following the project.

The establishment of a logging camp in the area would introduce a large number of people likely to compete for available subsistence resources. The seasonal tent platform camp that has been established for the past several years near the LTF during moose season could be moved or even discontinued if a logging camp is perceived as too disruptive or competitive. The introduction of additional hunters could deplete the available supply of game and discourage the use of the project area by Hoonah residents; however, the area has not been an important area for subsistence use by Hoonah residents because of the relatively sparse wildlife resources. Even the recent increased subsistence harvest of moose and black bear from the project area is not likely to change this pattern, as fish and deer are by far the most important subsistence resources for Hoonah residents (Foster Wheeler Environmental 2003d).

These potential effects are likely to vary by alternative based on the volume of timber to be logged in any given period of time with the type of effect likely to be less under Alternatives 5, 6, 4, and 3, and 2, in that order. The implementation of sales (especially in terms of size of offerings and timing) would also affect the magnitude of potential adverse effects.

ANILCA 810 Finding

The Record of Decision (ROD) for the Couverden project area will include a final finding about the significant restrictions on subsistence uses that may result from implementation of the Selected Alternative. The following paragraphs summarize the Final EIS evaluation and findings.

None of the alternatives would directly or indirectly adversely affect subsistence uses in terms of abundance and distribution of subsistence resources for the Couverden project area, although the Forest Plan concludes that the Forest Plan will do so for deer for the forest overall, due to cumulative effects. It is also unlikely that any of the alternatives would adversely affect subsistence uses in terms of access and competition for the non-roaded portions of the project area.

All action alternatives could, however, adversely affect subsistence use of the roaded portion of the project area through potential short-term restrictions on access while logging is taking place. These effects could be minimal (if the LTF and roads remain open and users consider continued use safe and attractive) or there could be short-term restrictions on access while logging is taking place. In addition, all action alternatives could also have adverse effects though short-term increased competition for resources because of the probable necessity for a logistical support base/camp in the project.

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Mitigation of these effects is possible under all alternatives but would depend on how timber sale activities (and road management and public information dissemination and coordination) are implemented. The order of the alternatives in terms of the least amount of probable effect and/or greatest possibility for mitigation of effects is Alternative 1, 5, 6, 4, and 3, and 2.

The results of this analysis indicate that the direct effects of the Couverden project and the potential foreseeable and cumulative effects from implementing the Forest Plan through the end of the rotation do not present a significant possibility of a significant restriction to any subsistence uses.

Necessary, Consistent With Sound Management of Public Lands Project Area

The proposed action alternatives are necessary as a component of the timber management program designed to implement the 1997 Forest Plan and comply with the Tongass Timber Reform Act (TTRA). The proposed alternatives provide various options that can help meet the objectives of the Forest Plan and the TTRA for timber harvests, while also providing reasonable protection measures for Forest resources, especially for subsistence. The alternatives are consistent with the Forest Plan, laws, regulations, policies, public needs, and capabilities of the land.

Amount of Land Necessary to Accomplish the Purpose of the Activity

The amount of public land necessary to implement each alternative is, considering sound multiple use management of public land, the minimum necessary to accomplish the purpose of that alternative. Rural communities use the Couverden project area for subsistence uses, and such uses will potentially be adversely affected by each of the proposed alternatives, as discussed above. These potential effects are balanced against the beneficial results (purpose) of each alternative. Reducing timber harvest in one area and concentrating it in another merely shifts the balance of potential adverse effects and benefits from one set of communities to another set.

Minimization of Potential Adverse Effects on Subsistence Uses and Resources

The Forest Plan takes considerable steps to minimize the impacts of forest management practices on subsistence uses and subsistence resources. The overall Forest Plan Land Use Designation (LUD) strategy confines timber harvest to certain parts of the forest, and specifies standards and guidelines for the minimization of effects on subsistence uses even in those areas. Important components implementing the standards and guidelines are timber harvest prescriptions, road access management strategies, post-timber harvest practices, and other measures. As discussed above, each of the proposed alternatives can incorporate the full suite of such implementation and mitigation measures to minimize potential adverse effects on subsistence uses and subsistence resources.

ANILCA 810 Hearings

ANILCA 810 hearings were held in Hoonah and Gustavus to collect public input on subsistence users in the project area and how the alternatives would affect subsistence use. This information was incorporated into the discussion above, and transcripts of the hearings are included in Appendix E.

3 Affected Environment and Environmental Consequences

Recreation

Introduction

National Forest System (NFS) and other public land on the southern Chilkat Peninsula are well known for the pristine natural appearance of mountain and marine landscapes. Recreation opportunities in the southern region of the peninsula include Glacier Bay National Park approximately 17 miles to the west, the Endicott River Wilderness Area approximately 20 miles to the north, and St. James Bay State Marine Park approximately 17 miles to the north, all of which attract residents and tourists alike. Landscapes in this region are visible from a major public travel route, Icy Strait, which is a part of the Alaska Marine Highway and receives heavy annual use. This section describes the current recreation opportunities and values in the project area and evaluates the effects of the proposed timber sale on the recreation resources and opportunities in the area. The following discussion is based on the Recreation Resource Report (Foster Wheeler Environmental 2003I).

Affected Environment

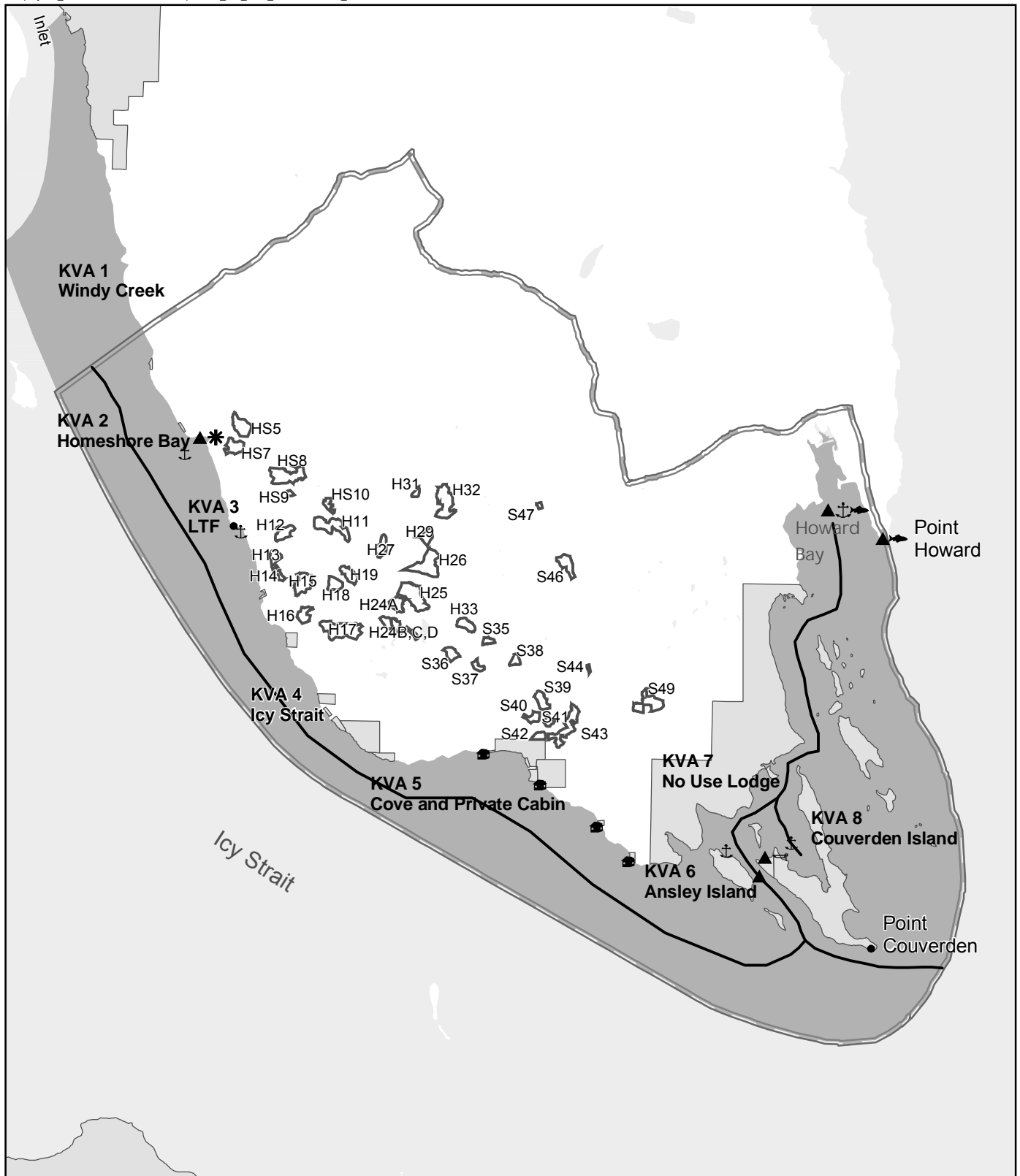
The project area and its surroundings attract recreation use by tourists from outside the region and Southeast Alaska residents, especially those from the Juneau, Hoonah, Gustavus, and Excursion Inlet communities. Recreation activities within, and near, the project area include freshwater and saltwater fishing, hiking, hunting, boating, beach combing, biking, and nature viewing (wildlife and scenery) (Figure 3-22). Outfitters and guides also lead groups in the project area. Residents and tourists traveling between Juneau and the Glacier Bay National Park Wilderness area frequently free-float in the project area, specifically in Swanson Harbor, Couverden Island Cove, and the Marine State Park near Couverden Island (Flynn 2002). The state of Alaska owns most of these popular spots in the southern portion of the project area.

Access

The access points to this area are Howard Bay, Swanson Harbor, Homeshore Bay, the LTF south of Homeshore, and Icy Strait. The main mode of transportation to the project area is by motorized boat. The priority routes and use areas, designated in the 1997 Forest Plan, are Icy Strait (Alaska Marine Highway/ tourship route/ small boat route), Homeshore (near the Couverden LTF), Couverden Island, and other surrounding areas (saltwater use/ dispersed recreation/ boat anchorages). The project area is also a fly-over route for local airplane services.

Past Activity

Between 1979 and 1992, timber on approximately 2,463 acres in the project area was harvested. Most of the harvested acres are located in the Homeshore, Humpy, and Swanson River drainages. The road network constructed for the past harvest activities attracts specific types of recreation, such as biking, hiking, hunting, and nature viewing, and provides access to backcountry in the roadless area. This harvested land



Legend

- | | |
|-------------------------|----------------------------|
| • Point of Interest | Water Body |
| — Local Boat Route | ⚓ Anchorage |
| ■ Charter Boat Use | * Beach |
| □ Unit Pool (Unit# H33) | ▲ Outfitter Guide Use |
| ▤ Project Boundary | ■ Private Recreation Cabin |
| ■ Non-NFS Lands | ⚓ Public Float |
| | ➡ Sport Fishing |

Figure 3-22
Recreation Areas



0 0.5 1 2
Miles

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has had between 10 and 25 years to revegetate, and some areas may meet a modification or partial retention Visual Quality Objective (VQO). The past timber harvest is evident from saltwater and the coastline on the east side of the Icy Strait travel route.

Recreation Opportunities

The project area includes five recreation sites and one public recreation place. Inventoried recreation sites are specific existing or potential locations identified by the Forest Service as having recreation value. Recreation sites in the project area include the boat anchorage near the log transfer facility (LTF), three private recreation residences, and a dispersed campsite near Windy Creek. Beach combing off Homeshore Bay was identified in the Forest Service GIS database as a public recreation place.

Boating and saltwater fishing are the most popular recreation uses in the project area. The southern project area has high seasonal boating traffic, which includes Couverden and Ansley Islands, Swanson Harbor, Howard Bay, and No Use Ledge. Boaters traveling between Juneau and Icy Strait commonly anchor in Swanson Harbor, Couverden Island Cove, or the Marine State Park near Couverden Island (Flynn 2002). The main boat anchorages are located around the LTF and the Couverden Island area. The anchorage locations and local boat routes are identified on Figure 3-22.

Charter boats are attracted to this area for the saltwater fishing in Windy Creek, Homeshore Bay, and throughout the Couverden Island area. Observations indicate frequent charter boat use of the project area (Flynn 2002, USDA Forest Service 2001). The preferred charter boat route and use area through Couverden Island and the surrounding islands is shown on Figure 3-22 (Douglas and Douglas 2002).

Various wildlife occupy the project area, including moose, black bear, wolf, and mountain goat. Black bear is by far the most popular species for both local and outfitter/guided hunters. Although moose are attractive for wildlife viewing in this area, the Endicott River area, 60 air miles to the north, is preferred by moose hunters on the Chilkat Peninsula. Some residents from nearby communities hunt bear and deer in the project area, in addition to the outfitter and guide hunting tours.

The existing road network and the closed temporary roads provide excellent access to the wildlife and natural scenery in the project area. Once arriving in the project area by boat, visitors can hike or use off-highway vehicles (OHVs) to drive the roads. There are no official Forest Service hiking trails in the project area. Opportunities to see moose, black bear, wolves, and mountain goats are good (Figure 3-23).

Mountain biking in the project area also takes advantage of roads created for the past timber harvest.

Outfitter Guide Uses

Outfitter and guide use permits from 1997 through 2000 were issued for a variety of uses within the project area. These permits were concentrated in Harbor locations. Permitted activities included mountain biking, hiking, nature

Figure 3-23. Moose and Calf along Road within the Project Area



viewing, black bear hunting, and fishing. Road-based nature tours, which the Homeshore, Point Howard, Couverden Island, Howard Bay, and Swanson include nature viewing, hiking, and biking, were the most popular forms of outfitted or guided recreation. Mountain biking had the most recreation hours of the outfitted/guided activities. Hiking had the second most recreation hours of outfitter/guided activity, although there are no Forest Service hiking trails within the project area (USDA Forest Service 2002b).

Howard Bay is proposed as an “enclave” for future recreation planning in the Shoreline Outfitter/Guide Draft EIS. The recreation carrying capacity for Howard Bay could accommodate large groups of visitors on a regular basis.

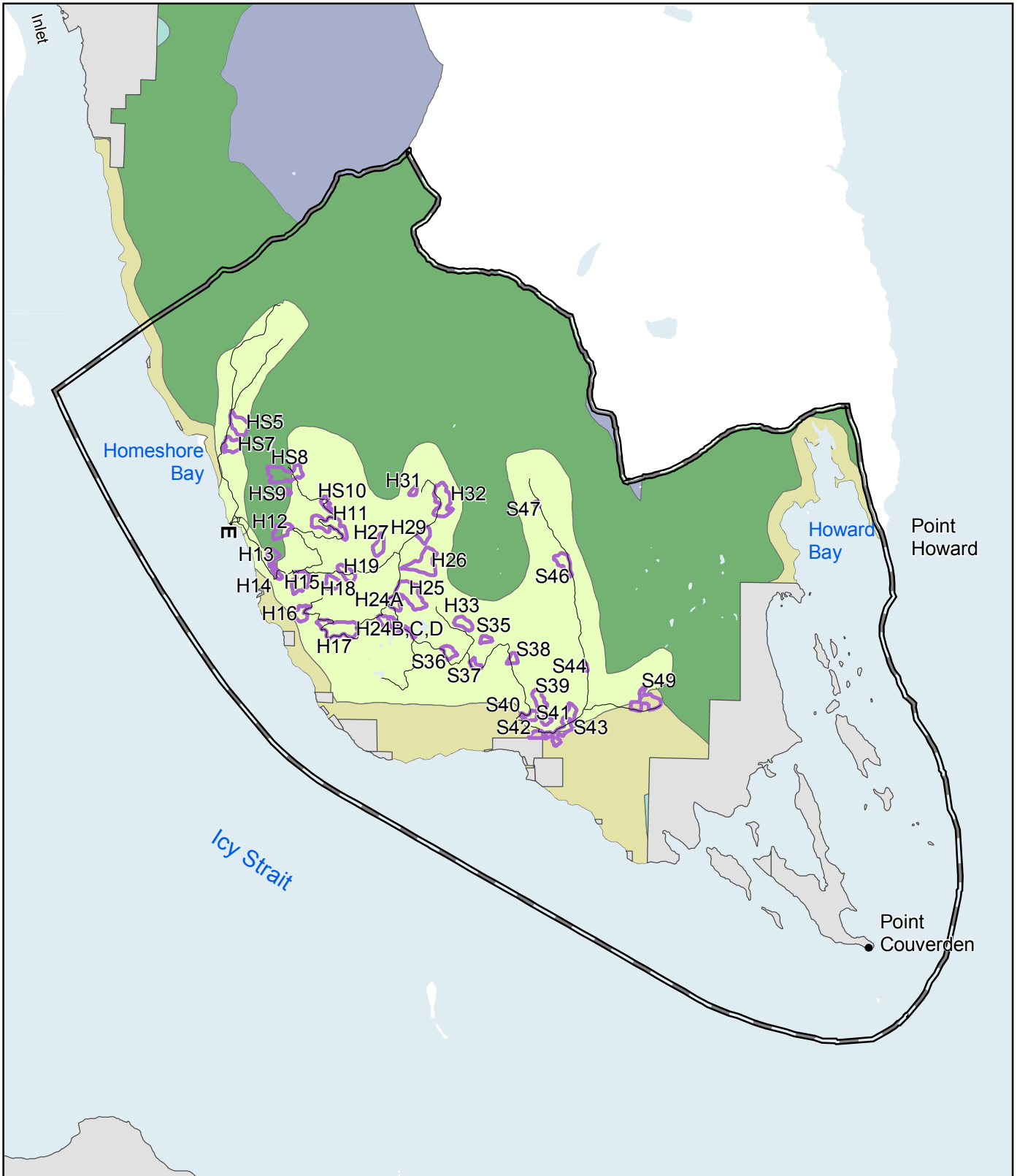
Other Recreation Uses

Roadless Area #304 is located north, east, and south of the existing road network. The interior Chilkat Peninsula offers hikers, backpackers, and mountaineers a rugged environment, a high degree of challenge, and unlimited opportunities to experience solitude. High wildlife values coincide with high-quality dispersed recreation areas in Roadless Area #304. The proximity to all-weather anchorages, coves, and beaches offer excellent opportunity for beach combing, camping, and picnicking. Homeshore Bay is a good example for these activities. Solitude is less likely to be experienced along the shoreline due to seasonal boat and air traffic.

No recreation facilities are maintained by the Forest Service in the project area; however, there is a campsite associated with the LTF. Other

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	<p>recreation uses in the project area include activities related to use of private recreation cabins located on private land along the south shoreline.</p>
Desired Future Recreation Conditions	<p>The desired recreation conditions in the project area are guided by the standards and guidelines for the Land Use Designation (LUD) assigned to the area. The Recreation Opportunity Spectrum (ROS) provides a framework for defining types of outdoor recreation opportunities the public might desire. It also provides a framework for evaluating the change in recreation opportunities as a result of management prescriptions or development actions, such as the proposed timber sale. The seven ROS classes are defined by a combination of seven ROS setting indicators (USDA Forest Service 1997a). These include visual quality, access, remoteness, social encounters, visitor management, on-site recreation development, and visitor impacts.</p>
Recreation Opportunity Spectrum	<p>A variety of ROS classes are within the project area. These include Primitive (P), Semi-primitive Non-motorized (SPNM), Semi-primitive Motorized (SPM), and Roaded Modified (RM) (Figure 3-24 and Table 3-66). Most of the project area is in SPNM. The SPNM ROS has a predominantly natural or natural-appearing setting. It also has a strong feeling of remoteness from developed areas. Roads may be present in SPNM. Motorized vehicles, however, are typically not present. The Partial Retention Visual Quality Objective (VQO) should not be exceeded in SPNM (refer to Issue 5, Scenery, for details on VQOs).</p> <p>The RM ROS is located around the existing road network in the project area. Land in RM is altered, but the activities do not degrade the basic resource elements. All forms of travel are present in RM. Visitors experience a low concentration of human sights and sounds associated with a backcountry roaded setting. The Maximum Modification VQO should not be exceeded in this ROS.</p> <p>Land in the SPM ROS is located along the coastline in the project area. The Partial Retention VQO should not be exceeded in this ROS. The Retention VQO should not be exceeded in a 0.25-mile strip of coastline near Homeshore Bay (Figure 3-9 in the <i>Scenery</i> section). A small area of the P ROS is located along the eastern edge of the project boundary. The Retention VQO should not be exceeded in this ROS.</p>
Land Use Designations	<p>The Forest Plan allocated four different LUDs to the project area, including Timber Production, Scenic Viewshed, Semi-Remote Recreation, and Old-Growth Habitat (Figure 3-9 in the <i>Scenery</i> section). The Forest Plan has specific recreation and tourism standards and guidelines for each LUD and for each ROS class (Table 3-66). Each of these LUDs has management prescriptions applicable to recreation and tourism, which are discussed in the Forest Plan. The desired condition for each ROS class is described in Appendix B of the Recreation Resource Report (Foster Wheeler Environmental 2003I). The proposed timber sale actions may change the existing ROS classification in the project area towards the condition desired for that LUD under the Forest Plan.</p>



Legend

- LTF - Log Transfer Facility
- Point of Interest
- Existing Classified Road
- Unit Pool
- Project Boundary
- Non-NFS Lands

ROS Class

- Primitive
- Road Modified
- Road Modified Natural
- Semi-primitive Motorized
- Semi-primitive Non-motorized

Figure 3-24
Current Recreation Opportunity
Spectrum (ROS)



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Table 3-66
ROS Guidelines for LUDs within the Project Area

LUD	Acres	ROS
Timber Production	23,448	Generally RM
Scenic Viewshed	9,831	SPM, RN, or RM
Old-growth Habitat	2,798	SPNM or SPM
Semi-remote Recreation	8,470	Generally SPNM or SPM

Source: USDA Forest Service 1997a

Note: Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

Over half of the NFS land in the project area (51 percent) was assigned the Timber Harvest LUD. The Timber Harvest LUD is located in the higher elevations set back from the coastline. Approximately 22 percent of the project area was assigned the Scenic Viewshed LUD, located in the highly visible areas, mostly along the western coastline. Approximately 19 percent of the project area was assigned to the Semi-Remote Recreation LUD, located in the north. A small part of the Couverden project area, approximately 8 percent, was assigned to the Old-growth Habitat LUD. This LUD includes one Old-growth Reserve (OGR) located in the Swanson Creek drainage and one near the northeast boundary of the project area.

Recreation Value

The project area provides recreation experiences for locals and visitors alike. Regional tourism includes such activities as cruises, charter fishing, nature tours, active outfitted and guided tours, hunting, and airplane travel. Cruise ships do not port in the project area; however, the project area serves as a scenic background to observers from the cruise ships traveling through Icy Strait.

According to shoreline use data from the Forest Service, residents from local communities frequent the area more often than tourists visiting the region. A significant proportion of the economic base in the northern Tongass (excluding Juneau) is tied to the choice of individuals who continue to live in the small communities. The quality and number of recreation opportunities for locals may be as important to the economy in the northern Tongass as the commercial tourism and recreation operations that cater to visitors (USDA Forest Service 2003).

Potential Recreation Opportunities

There are opportunities to enhance the project area's recreation use. The main recreation use for the project area is wildlife viewing, hiking, biking, and backpacking associated with the roaded areas surrounded by the roadless area's natural setting.

Motorized boats are the most popular and practical way to access the project area. Public access to NFS land could be facilitated by a seasonal

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dock at the LTF site. A dock was once located at the LTF site. After harsh winter storms damaged the dock, it was removed and placed elsewhere in the Tongass. A seasonal dock in this location is suggested for visitor access to the recreation activities in the project area from April to October. The dock would need to be stored for the winter. Hoonah (13 miles to the south) is the most likely storage site.

New facilities to accommodate wildlife and nature viewing along the roads would complement the increased access to the recreation activities. Cabin use in the Tongass has remained steady or increased from 1994 to 2000; therefore, a Forest Service cabin might attract more use to the area for locals and tourists. The main criteria used to justify an additional cabin in the Juneau Ranger District include a) potential visitor use, b) accessibility, and c) proximity to Juneau (Marvin 2003). There is potential for a cabin to be located along the beach southeast of the LTF or nestled elsewhere off of the road network. A cabin in this area would be reasonably close to Juneau and accessible by boat from Icy Strait. This area also offers hunting and fishing possibilities. Access to these recreation opportunities are enhanced by the existing road network. There is no need to construct a formal scenic boardwalk for wildlife viewing, because the area is not prime moose habitat. The existing roads are adequate for nature and wildlife viewing and need no improvements for this activity.

A draft of potential Capital Improvement Projects (CIP) within the District has recently been completed. One of the suggestions for a CIP is an additional cabin accessible by saltwater, which would fit the potential location near the Couverden LTF.

Environmental Effects

General Effects of the Alternatives on Recreation

In general, the new roads introduced in and around semi-primitive recreation opportunities would change the nature of the setting because of the road construction and the related timber harvest activity. Alternatives 2, 3, 4, and 6 propose different amounts and locations of roads, including new construction, reconstruction, and temporary roads (roads would be closed after timber harvest) (see Table 3-67). The effects of new roads on recreation opportunities would vary by location. Alternative 2 proposes roads within the inventoried roadless area. All roads new will be closed to motorized vehicles (except OHVs) after timber harvest.

The noise and activity in the project area generated by harvest would last for varying periods of time during timber harvest depending on the alternative. Road building and timber harvest activities would be heard by recreationists using the existing road network for hunting, hiking, nature viewing, backpacking, or any road-based recreation activity. Opportunities for solitude and quiet would be lost for periods of time. Road construction and timber harvest (noise, land alteration) would disturb habitat for wildlife, which could negatively impact hunting and nature viewing. The period would vary

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**Table 3-67
New Road Construction by Alternative**

	Alternative					
	1 (miles)	2 (miles)	3 (miles)	4 (miles)	5 (miles)	6 (miles)
New classified road	0	2.7	1.8	0	0	0
Classified road construction on unclassified roadbeds	0	1.6	1.6	1.4	0	0.4
Total classified road construction	0	4.3	3.4	1.4	0	0.4
Temporary road construction	0	3.5	3.5	2.6	0	0.5
Total new road construction	0	7.8	6.9	4.0	0	0.9
Reconstruction	0	0	0	2.9	0	0

Notes:

1. All new roads would be closed to normal vehicle traffic after timber harvest under all alternatives.
2. Miles are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

depending on the alternative from short periods every year under Alternative 5 to a 3- to 5-year period under Alternative 2. For each alternative, alterations to the scenery would be visible from popular local and tourist saltwater travel routes and use areas, although the respective VQOs would be met. The recreation activity on land may decline in the project area during the timber harvest activity due to the change in recreation experience and the temporary road closings. In contrast to the effects on recreation during timber harvest, the proposed new and temporary roads could provide increased access to hiking, biking, nature viewing, hunting, and the remote roadless areas.

Changes to the ROS Settings and Recreation Experiences

The ROS around the existing road network was based on the setting and the terrain. Changes to the existing ROS settings would occur when land in the SPNM or SPM settings were within 0.5 mile from proposed new road construction in an alternative, which is based on 1997 Forest Plan ROS criteria. In this analysis, new road construction was considered to be road construction in an area for the first time. These existing pathways can be used for recreation purposes, and they were not involved in the 0.5-mile ROS analysis. The recreation settings would also be considered affected by an alternative if a change in the surrounding land would not support the current ROS class. For example, SPM would change to RM if the results of an alternative left a pocket of SPM less than 2,500 acres surrounded by land in the RM setting.

Most of the ROS changes would be the result of road construction and the activities associated with the roads. The ROS changes would be primarily from SPM or SPNM to RM. The RM setting is the most compatible with the proposed timber harvest and road construction. This is demonstrated by the current location of the RM ROS within the project area.

Direct and Indirect Effects

Under Alternative 1, No Action, the recreation resources and opportunities would be the same as current conditions in the foreseeable future. The recreation opportunities in the project area would continue to be centered on

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maritime recreation, which is not managed by the Forest Service. Land-based recreation opportunities, primarily along the established road network, would continue at least at the current use levels. The current ROS settings would not change (Table 3-68). The recreation setting within the roadless area would not change. The potential to expand recreation opportunities in this area would also remain the same.

Under Alternative 2, there would be approximately 7.8 miles of road construction in the project area. This would be more new road construction than proposed in any other alternative (Table 3-67). Approximately 0.6 mile of new road would be in the inventoried roadless area and 0.3 mile in unroaded areas. This is the only alternative that proposes new roads in roadless or unroaded areas. All new roads would be closed to motorized vehicles (except OHVs) after the conclusion of timber harvest activities.

Approximately 1,337 acres of the project area would be converted to RM as a result of the road construction and timber harvest (Table 3-68). Most of the change would be from SPNM to RM under this alternative. The RM ROS is a class compatible with the Timber Production and Scenic Viewshed LUDs. The opportunities for road-based recreation opportunities would be expanded under the alternative.

Recreationists using saltwater areas near the LTF would mostly likely hear more noise because of the four units relying on helicopter harvest. The recreationists most affected would be those using the existing road network during harvest and road construction activities.

Under Alternative 3, there would be approximately 6.9 miles of road construction in the project area (Table 3-67). No roads would be built in roadless or unroaded areas. All new roads would be closed to motorized vehicles (except OHVs) after the conclusion of timber harvest activities.

As a result of the road construction and timber harvest, approximately 1,054 acres of the project area would be converted to RM (Table 3-68). Most of the change would be from SPNM to RM under this alternative. Alternative 3 would harvest fewer acres and build fewer roads than

Table 3-68
ROS Setting Changes by Alternative

ROS Setting	Alternative 1 (no action)	Alternative 2		Alternative 3		Alternative 4		Alternative 5		Alternative 6	
	Acres of ROS	Acres of ROS	Net Change	Acres of ROS	Net Change	Acres of ROS	Net Change	Acres of ROS	Net Change	Acres of ROS	Net Change
P	194	194	–	194	–	194	–	194	–	194	–
SPNM	24,509	23,289	(1,220)	23,754	(755)	24,141	(368)	24,509		24,338	(171)
SPM	5,523	5,407	(116)	5,225	(298)	4,905	(618)	5,523	–	5,523	–
RN	58	58	–	58	–	58	–	58	–	58	–
RM	14,263	15,599	1,336	15,316	1,053	15,250	987	14,263	–	14,434	171

Notes:

1. Acres are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

P = Primitive, SPNM = Semi-primitive Non-motorized, SPM = Semi-primitive motorized, RN = Roaded Natural, RM = Roaded Modified

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Alternative 2; therefore, noise from road building and timber harvest activities would have less of an effect on the recreationists using the existing road network. As under Alternative 2, the recreationists most affected would be those using the existing road network during harvest and road construction activities. Unlike Alternative 2, recreationists using saltwater areas near the LTF would not be subjected to the noise from helicopter harvest.

Under Alternative 4, there would be approximately 4.0 miles of road construction in the project area (Table 3-67). There would also be 2.9 miles of road reconstruction, all of which would be in the Swanson drainage. No roads would be built in roadless or unroaded areas. All new roads would be closed to motorized vehicles (except OHVs).

As a result of the road construction and timber harvest, approximately 987 acres of the project area would be converted to RM (Table 3-68). Most of the change would be from SPM to RM under this alternative. There would be less change in recreation access than under Alternatives 2 and 3. Recreationists using saltwater areas near the LTF would mostly likely hear more noise than in Alternatives 2 or 3 because 21 percent of the harvest units rely on helicopter yarding. Helicopter harvest of Unit S41 might also temporarily affect recreation near the private recreation residence along the coast. The recreationists most affected would be those using the existing road network and the anchorage near the LTF during harvest and road construction/reconstruction activities.

Alternative 5 is the most responsive action alternative to maintaining the current recreation opportunities. No road construction is associated with this alternative (Table 3-67). All timber harvest would take place within 500 feet of existing open roads. There would be no harvest in roadless or unroaded areas.

The ROS classifications would not change under Alternative 5; they would remain the same as under Alternative 1 (Table 3-68). The effects from road construction in Alternatives 2, 3, 4, and 6 would not occur under Alternative 5. The immediate effect of timber harvest (noise, land alteration) would disturb wildlife habitat, which could negatively affect hunting and nature viewing, but the scale of this disturbance would be less than under Alternatives 2, 3, or 4. Recreationists using saltwater areas near the LTF would not be affected by noise from helicopter harvest. The recreationists most affected would be those using the existing road network during harvest activities.

Alternative 6 would harvest less acres than any of the action alternatives and would build less road than Alternatives 2, 3, and 4. This alternative would include approximately 0.9 mile of new road construction in the project area (Table 3-67). No roads would be built in roadless or unroaded areas. All new roads would be closed to motorized vehicles (except OHVs).

Approximately 171 acres of the project area would be converted from SPNM to RM as a result of the road construction (Table 3-68). Alternative 6 would affect road-related recreation less than Alternatives 2 and 3 because there would be less new road to provide additional recreation access. Unlike Alternatives 2 and 4, recreationists using saltwater areas near the LTF

Affected Environment and Environmental Consequences **3**

Cumulative Effects

would not be subjected to the noise of helicopter harvest. The recreationists most affected would be those using the existing road network during harvest and road construction activities.

Past land altering activities in the project area include timber harvest and road construction. This activity changed the land based recreation opportunities and converted approximately 45 percent of the area from P and SPNM to Roaded Natural (RN), RM, and SPM. This change was mainly based on the road network, which expanded recreation access to the area. Foreseeable projects in the Couverden project area include ongoing road maintenance, and public road use. Other than temporary noise, these foreseeable activities would have little effect on the recreation opportunities in the area and would not change ROS settings.

Under Alternative 1, the current ROS classifications would not change in the short term. Other than temporary noise, the foreseeable future activities would not significantly affect the recreation opportunities in the area. Over time, the landscape as seen from boating routes within the project area would continue towards a natural condition.

Alternative 2 would increase the combined SPM, RN, and RM ROS classes from 45 percent of the project area to 47 percent. Road construction under Alternative 2 would expand existing recreation access in the project area. When seen with the past timber harvest activity over the landscape, additional timber harvest would emphasize the presence of human activity.

Cumulative effects for Alternative 3 are similar to the effects under Alternative 2, except that the area converted to SPM, RN, and RM would increase to 46 percent of the project area rather than 47 percent.

Alternative 4 cumulative effects are similar to the effects under Alternative 2, except that there would only be a slight increase in the area currently in SPM, RN, and RM (approximately 0.5 percent).

Under Alternative 5, no ROS categories would change; they would remain the same as under Alternative 1. Alternative 5 would preserve the current recreation opportunities, notably in the SPNM areas. This alternative would not contribute to the expansion of road-based recreation opportunities.

Cumulative effects for Alternative 6 are similar to the effects under Alternative 3, except at a much-reduced scale. There would only be a small area converted from SPNM to RM, 0.1 percent. This alternative would contribute less to the cumulative change in current recreation opportunities than any of the action alternatives, except Alternative 5, because the scale of the harvest-related activities.

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Heritage Resources

Heritage resources generally represent past human activities. The project area is between Icy Strait and Lynn Canal and contains a few sites identified as early Hoonah Tlingit villages. Relatively few heritage resources were identified during heritage resource surveys for the project. During the pedestrian inventory of a sample of land within the Couverden Timber Sales project area, the archaeological team recorded three heritage resource sites. The sites include a historic to recent fishing, hunting, trapping, and tideland gathering site containing the remains of a cabin and smokehouse; the remains of one historic commercial fishing pier; and a previously recorded and excavated early historic period house site, which contains two previously unrecorded culturally modified trees.

As individual properties were located, sufficient information was gathered to allow the Forest Service to make determinations of eligibility for the National Register of Historic Places (National Register). After application of the eligibility criteria for the National Register, the Forest Service submitted determinations of eligibility to the Alaska State Historic Preservation Officer (SHPO) for two of the sites recorded during the inventory of the sale area, while the remains of the fishing pier were recommended ineligible (April 10, 2003, letter to SHPO, Couverden Timber Sales Planning Record). The SHPO concurred with the Forest Service determination that there would be no effect to the two eligible historic period sites as a result of implementing any of the action alternatives.

A discussion of previous heritage resource surveys can be found in the Heritage Resources Resource Report (HRA 2003). Copies of these reports can be found at Forest Service offices, the Alaska SHPO, and the Hoonah Indian Association (the federally recognized Indian Tribe with traditional ties to the project area). Generally, copies of these reports are not available to the public due to the sensitive nature of heritage resources and the need to protect them. The earlier heritage resource work provided a starting point for the planning and implementation of the current heritage resource inventory. Previous heritage resource work in the project area is referenced or reported in eight published sources or limited circulation inventory reports. The type of work includes visits to one or more known or reported heritage resource sites; inventories along all or most of the shoreline area; sample or extensive excavation of selected heritage resource sites; and, most recently, inventories of proposed quarry areas to be used for road building.

The heritage resources study for the Couverden project area was designed to satisfy federal and state resource management legislation as summarized in regulations prepared by the President's Advisory Council on Historic Preservation (Advisory Council) entitled, "The Protection of Historic and Cultural Properties" (36 CFR, Part 800). These regulations encompass the requirements of Section 106 of the National Historic Preservation Act of 1966 (as amended), the National Environmental Policy Act of 1969, and FSM 2300, among other laws and regulations. The heritage resource inventory plan was conducted in accordance with the Programmatic Agreement with the Advisory Council and the Alaska SHPO; Heritage Resources Forest-wide Standards and Guidelines presented in the Forest

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Plan (USDA Forest Service 1997:4-14 – 4-17); and Alaska Heritage Resource Survey (AHRs) guidelines. Implementation included pedestrian examination of the ground surface, along with subsurface investigation, where necessary, to recover adequate data to assess the potential for significant resources in the project area.

Heritage resource standards and guidelines developed and refined over the past several years by archaeologists on the Tongass National Forest and incorporated into the Programmatic Agreement with the Advisory Council and the Alaska SHPO define high and low sensitivity zones based upon the probability that they may contain heritage resources. The heritage resource study was conducted following the definition of high sensitivity zones, which includes “all land between lower low water and 100 feet of elevation, with no consideration of slope.” High sensitivity areas include passes; portages; Class 1 streams and lakes, including areas of barrier falls; fossil beaches or terraces; areas of caves or rockshelters; myth or legend sites; raw material source areas; lode or placer mining areas; and areas identified by historical, ethnographic, or oral history research. The low sensitivity zone on the Tongass National Forest and immediately adjacent lands includes all land not relegated to the high sensitivity zone (Programmatic Agreement 1995).

In June of 2002, archaeologists conducted an inventory for heritage resources on approximately 740 acres within the project area. The inventory initially focused on several proposed harvest units and proposed classified roads all located in the low sensitivity zone. No new heritage resources were located during intensive inventory of about 540 acres in or adjacent to the proposed harvest units or classified roads. As inventory of the proposed harvest units and classified roads neared completion, approximately 200 additional acres were surveyed in a continuous strip along the shoreline. Inventory in the high sensitivity zone resulted in the location and evaluation of the three heritage resource sites referenced above.

Environmental Effects

The Forest Service and state of Alaska's Office of History and Archaeology general objectives for the Couverden Timber Sale are to document heritage resources and to preserve and protect National Register listed or eligible resources. Where avoidance and in situ preservation are not viable management options, measures need to be implemented to recover data as a way of mitigating adverse effects to significant heritage resource properties.

Direct effects on heritage resources may result from activities such as road building, timber harvest, or construction or reconstruction of log transfer facilities. While natural processes such as erosion and redeposition can also adversely affect heritage resources by either covering the resources with sediment or uncovering and washing away resources when a channel changes, such processes can be accelerated by timber harvest-related activities. Indirect effects on heritage resources, such as changes in stream flow or sediment loads, or vandalism or human disturbance to the resources resulting from increased access to an area, may result from timber harvest and road building.

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None of the alternatives under consideration for the Couverden EIS project area would result in any effects on known heritage resources from the proposed timber sale activities. The bulkhead portion of the log transfer facility (LTF) constructed as part of the previous round of logging is still in place and an area was previously leveled and prepared for a logging camp. Activities related to preparing these areas for the current round of proposed timber harvest should be monitored for heritage resources, especially in the area of the previously reported shell midden site. Under all action alternatives, no new alternatives are proposed in high sensitivity zones. Selection of any of the alternatives would, therefore, have no effect on known heritage resources in the project area.

The preferred management approach for heritage resource sites by the Forest Service and other agencies is avoidance. For the current project, the known heritage resources would be avoided. For all action alternatives, logging operators and road crews would be urged to avoid moving logs or equipment near shore areas to minimize impact to shoreline sites and to stay within cleared rights-of-way and the LTF.

In cases where development is planned in areas of high heritage resources site sensitivity or in the vicinity of known heritage resources, the Forest Service would implement a plan for monitoring known significant resources. In addition, Forest Service personnel would monitor for and record previously unknown sites, if any are located, as per the 1995 PA. If the monitoring program documents effects to sites, measures should then be developed to mitigate those effects. If new sites are exposed during project implementation, work would be suspended and not resumed until after consultation with the SHPO is complete.

Cumulative Effects

Impacts from natural decay, landscape changes, private developments, and timber management activities potentially result in the loss of nonrenewable heritage resources in Southeast Alaska. Development activities of all kinds pose particular threats to heritage resources because such activities tend to be located in the same places that heritage resources are found, such as near the mouths of drainages or along sheltered coastal settings.

It is impossible to determine the exact nature of resources that may have been previously disturbed in project area. While heritage resource investigations and data recovery at selected sites took place in the project area in the mid-1960s, it was not until the early 1980s that intensive investigations and mitigation measures became a regular part of the environmental review process. The implementation of updated research and survey designs based upon the results of previous work and current methods and techniques, combined with various mitigation measures, will preserve significant properties and provide data that will guide future research and management activities. In addition, current Forest Service management approaches for Beach Fringe/Estuary and Riparian Protection will benefit heritage resources through decreased activity in high sensitivity zones and reduced indirect effects, such as erosion or deposition of sediments from, or deposition of sediments on, heritage resources located in or near drainages or beach fringe areas.

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Cumulative effects include the damage to the reported site at or near the LTF and to other reported sites discussed above. None of the alternatives under consideration for the Couverden project area would result in any effects on known heritage resources from the proposed timber sale activities. Currently, there are no other timber sales under way in or near the project area; thus, no additional cumulative effects to heritage resources are expected.

This Final EIS summarizes existing knowledge of heritage resources within the project area. Previously recorded interviews and oral history from Tlingit clans, groups, or individuals in Hoonah indicate use of lands adjacent to coastal areas and anadromous fish streams in the area prior to contact or early in the historic period (Ackerman 1965 and 1968, Goldschmidt and Haas 1998, Sealaska Corporation 1975). In 2002, the Forest Service consulted with the Hoonah Indian Association and Douglas Indian Association in Government-to-Government consultation. Heritage personnel also consulted with and shared cultural site information with the Hoonah Indian Association as required by Section 106 of the National Historic Preservation Act. The Forest Service and Heritage personnel participated in public meetings to provide information and hear comments and concerns regarding the proposed timber sale in several communities, including Hoonah, Juneau, and Gustavus. Forest Service staff also met with representatives of the Hoonah Indian Association following publication of the Draft EIS to discuss issues related to the proposal.

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Transportation

Affected Environment

The road system in the Couverden project area consists of approximately 36 miles of rock classified roads constructed for timber harvest purposes in the late 1970s and 1980s (Figure 2-1). Approximately 8 miles of unclassified roads also exist. These unclassified roads are roads that were originally built as temporary roads for timber harvest and closed after the completion of harvest. Most of the unclassified roads have been closed naturally by vegetation. The road system accesses potential timber harvest areas, rock sources, and dispersed recreation areas. All of the roads are in the Scenic Viewshed and Timber Production Land Use Designations (LUDs). The road system is isolated by the geography of the project area. The only way for road vehicles to gain access to the road system is to be barged from another road system. Private barges can be contracted for this service, which is generally attempted only in favorable weather. The road system includes one marine access point. This is the log transfer facility (LTF) at the beginning of Road 8550 (Figure 1-2). The LTF is in operational condition and is suitable for loading logs on barges. The LTF has a current permit.

The roads in the project area are classified based on current or anticipated use into maintenance levels. All classified roads in the project area are either maintenance level (ML) 1 or 2. MLs incorporate traffic service levels, as described in the following definitions:

- ♦ ML 1: Roads are closed by barrier, bridge removal, or organic encroachment and are monitored for resource protection. Basic custodial maintenance is performed to perpetuate the road and to facilitate future management activities.
- ♦ ML 2: Roads are maintained for high-clearance vehicles and are monitored for resource protection. Traffic is normally minor, usually consisting of administrative or recreational uses.

There are currently 5.0 miles of ML 1 road and 30.7 miles of ML 2 road in the Couverden project area. Although the forest road database lists all of Road 8555 as ML 2, field work during 2002 determined that the portion above Milepost 1.2 should be listed as ML 1. Road 8554 above Homeshore Creek should also be listed as ML 1. These roads were put in an ML 1 status, but they have not been recorded as ML 1 in the database. This has been corrected.

Some maintenance in the Couverden project area has been deferred. This includes removing vegetation, replacing or adding structures, improving surfacing, and installing or replacing signs. These activities fall into two categories, including critical and non-critical maintenance. Critical maintenance includes maintenance that is needed for resource protection or safety. Approximately \$18,400 of critical maintenance and \$189,000 of non-critical maintenance has been deferred on project area roads. These costs are based on average costs for each identified maintenance item rather than

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on site-specific costs. An additional maintenance need was identified in the roads analysis completed for this project (Foster Wheeler Environmental 2003m). The bridge at Milepost 1.411 on Road 8550 should be resurfaced, because a small hole in the bridge deck poses a minor safety hazard.

Erosion associated with roads depends on several factors. These include the material used to surface roads, slope, soil type, and traffic levels. Roads in the project area have gravel surfaces and, therefore, contribute less sediment than roads with native soil surfaces. In addition, traffic levels (and thus erosion rates associated with vehicle use) are low. Approximately 0.27 mile of roads on slopes greater than 67 percent exist in the project area. These sections of road are short segments that are scattered throughout the project area. Roads are generally in good condition for their respective management level and are not presently eroding; however, cut or fill slope erosion was noted on Road 8553 near Milepost 8.2 and on Road 8562 at Milepost 2.5.

Roads in the project area do not appear to be a major cause of mass wasting. Improperly placed fill or road placement appears to have contributed to one landslide on Road 8553 at Milepost 2.4 and one landslide on Road 8555 at Milepost 1.9. Roads have been impacted by landslides at two other places (Road 8553 at Milepost 8.3 and Road 8555 at Milepost 3.9). These landslides originated in clearcuts above the road and flowed downhill, damaging the roads. These were shallow, rapid landslides, rather than deep-seated mass movements and are not expected to continue to flow.

Road condition survey data identifies six stream crossings that may restrict the movement of fish. Two are on Class I streams: one on Road 8553 at Milepost 0.406 and one on Road 8553 at Milepost 11.695. Four culverts are on Class II streams: Road 8553 at Milepost 0.429, Road 8553 at Milepost 4.677, Road 8553 at Milepost 6.218, and Road 8553 at Milepost 12.375. These fish passage concerns are being reviewed by the District and will be corrected regardless of the decision on this project.

Environmental Consequences

The effects of the transportation system on other resources are considered in the specific resource sections (Roadless/unroaded Areas, Wildlife Habitat, Timber Sale Economics, Scenery, Soils, Watershed and Fisheries, Wetlands, TES Species, Socioeconomics, Subsistence, Recreation, and Heritage Resources). This section focuses on the effects of the alternatives on the transportation system and on post-harvest access.

Road Development

Table 3-69 displays the miles of new roads by alternative. Alternatives 1 and 5 would not add additional miles of road to the existing transportation system or reconstruct any ML 1 roads. The other alternatives require minor extensions of existing roads, including new construction of classified roads on the roadbeds of unclassified roads (former temporary roads built for earlier timber sales). Alternative 4 would reconstruct 2.9 miles of Road 8555. Table 3-70 displays road construction and reconstruction costs by alternative.

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Table 3-69
Transportation System Changes by Alternative

	Alternative					
	1	2	3	4	5	6
	Miles	Miles	Miles	Miles	Miles	Miles
New classified road construction	0	2.7	1.8	0	0	0
Classified road construction on unclassified roadbeds	0	1.6	1.6	1.4	0	0.4
Total classified road construction	0	4.3	3.4	1.4	0	0.4
Temporary road construction	0	3.5	3.5	2.6	0	0.5
Total new road construction	0	7.8	6.9	4.0	0	0.9
Reconstruction	0	0	0	2.9	0	0

Notes:

1. All new roads would be closed after timber harvest under all alternatives. Roads would be placed in storage and would not be suitable for normal vehicle traffic.
2. Miles are based on GIS mapping and numbers are rounded. Numbers may not be consistent with other tables due to small differences in GIS coverages and/or due to rounding.

Table 3-70
Road Construction and Reconstruction Costs by Alternative

	Alternative					
	1	2	3	4	5	6
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
New classified road construction	0	461,000	310,000	0	0	0
Classified road construction on unclassified roadbeds	0	120,000	120,000	105,000	0	30,000
Total new road construction	0	581,000	430,000	105,000	0	30,000
Reconstruction	0	85,000	85,000	121,500 ^{1/}	85,000	25,000
Temporary road construction	0	350,000	350,000	260,000	0	50,000
Total	0	1,016,000	865,000	486,500	85,000	105,000

1/ Includes reconstruction of three Class I crossings.

Rock Pits

Existing rock pits would provide the majority of the material needed for this project. New rock pits, if needed, would be located during sale layout and would follow applicable standards and guidelines, Best Management Practices (BMPs), and Visual Quality Objectives (VQOs) using an interdisciplinary process.

Access Management

The access management strategy for each road can include one or more of the following categories:

Encourage

Motor vehicle use is encouraged by appropriate signing, public notification, and active maintenance of the road prism.

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Accept

Motor vehicle use is allowed but not encouraged, while the road is maintained for administrative access.

Discourage

Motor vehicle use is discouraged by allowing alder growth at the road entrance, nonremoval of blowdown, or road prism deterioration within acceptable environmental limits (depending on designated maintenance level). To discourage use, the road may also be signed as “Not Maintained for Motor Vehicle Traffic.”

Eliminate

All motor vehicle use is eliminated by physically blocking the road. Where prescribed for long-term, intermittent roads, this strategy is achieved by placement of impassable barricades at road entrances. On short-term roads, removal of drainage structures effectively blocks vehicle traffic.

Prohibit

Motor vehicle use is prohibited by a road order (CFR closure). Implementation of this strategy on remote road systems may require the installation of gates, in addition to public notification and appropriate signing.

Prohibit Seasonally

Motor vehicle use is prohibited at times during the normal operating year. Seasonal prohibitions can be used to mitigate impacts to wildlife and subsistence resources. Administrative and certain permitted use of the road can continue during closure periods. Seasonal closures may be used in combination with cooperative efforts with fish and game protective agencies.

Where access is restricted, the access management strategy would generally be to “eliminate” rather than “prohibit” road use. Access to roads under USDA Forest Service jurisdiction can be restricted by regulation (36 CFR 212.7 and 261). In this case, applicable law confers a statutory right allowing entrance to public lands to search for minerals and to access mining claims (the project area has none at present). However, miners and prospectors would be required to obtain a permit to use restricted roads.

Access into newly roaded areas would be prohibited to minimize resource impacts under all action alternatives.

To meet access management objectives, including fish and wildlife protection and reducing maintenance costs, all new roads built for timber harvesting would be placed in storage after the completion of harvest activities, prohibiting vehicle access. Depending on the alternative selected, 4.3 (Alternative 2), 3.4 (Alternative 3), 1.4 (Alternative 4), 0 (Alternative 5), or 0.4 (Alternative 6) miles of newly constructed classified roads would be

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closed. In addition, all temporary roads would be closed: 3.5 (Alternative 2), 3.5 (Alternative 3), 2.6 (Alternative 4), 0 (Alternative 5), or 0.5 (Alternative 6) miles. All roads currently closed would remain closed. An additional 0.8 mile of the 8550 road currently open could also be closed to reduce access into critical bear feeding areas along Homeshore Creek. This would reduce human/bear interactions and disturbance; thus, 29.9 miles of road would remain open for public use after the completion of harvest activities, and the remaining existing and new roads will be closed. Except for 0.8 mile of the 8550 road, existing roads will remain open and will be available for OHV use. New roads constructed for this project will be placed in a storage condition after use. Roads in storage are not considered usable by normal vehicle traffic. Roads would be closed at the first practical point, either by tank trap at the beginning of the road, at the first stream crossing, or by official road closure order.

Table 3-71 displays the new roads proposed under each action alternative by road number. Table 3-72 displays the proposed road attributes for the proposed road system. Additional information on proposed roads, including a map of each road, is contained on the road cards located in Appendix C.

Log Transfer Facilities

The Forest Plan FEIS, page 3-311, identifies two potential sources for adverse effects associated with log transfer facilities (LTFs): structural embankment (placing rock in the water) and bark deposition (bark that accumulates under water). The Couverden LTF is currently operational. Some reconstruction may be needed for safe operation of the LTF, but the current footprint would not change; therefore, there would not be any adverse effects from rock placement. Logs would be loaded directly on to barges rather than dumped into the water, greatly reducing any adverse effects from bark deposition. Minor amounts of bark and other plant debris that do fall into the water would likely be rapidly dispersed by the strong current in Icy Strait.

Table 3-71
Proposed Roads by Alternative

Proposed Road	Alternative(s)
855011	2, 3
855321	2, 3
85533	2, 3, 4
85534	2, 3
85535	4
85551	4
85611	2, 3, 4, 6
85631	2, 3
85632	2

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Table 3-72
Road Attributes for Existing and all Proposed Roads

Road Number	Length (miles)	Functional Class	ROS Class	Traffic Service Level	Service Life	Operational Maintenance Level	Objective Maintenance Level	Traffic Management Strategy, Post Harvest
8550	1.4	C	RM	C	I	2	2	Accept
8550	0.8	C	RM	D	I	2	1	Prohibit
85501	1.8	L	RM	D	I	2	1	Prohibit
855011	1.0	L	RM	D	I	2	1	Prohibit
8553	12.7	C	RM	C	I	2	2	Accept
85533	0.2	L	RM	D	I	2	1	Prohibit
85534	0.6	L	RM	D	I	2	1	Prohibit
85535	0.3	L	RM	D	I	2	1	Prohibit
85531	1.6	L	RM	D	I	2	2	Accept
85532	1.2	L	RM	D	I	2	2	Accept
855321	0.9	L	RM	D	I	2	1	Prohibit
8554	2.4	L	RM	C	I	2	2	Accept
8555	1.2	C	RM	C	I	2	2	Accept
8555	2.6	C	RM	D	I	2	1	Prohibit
85551	0.2	C	RM	D	I	2	1	Prohibit
8561	1.5	L	RM	D	I	2	2	Accept
85611	1.1	L	RM	D	I	1	1	Prohibit
8562	2.8	L	RM	D	I	2	2	Accept
8563	4.7	L	RM	D	I	2	2	Accept
85631	0.1	L	RM	D	I	2	1	Prohibit
85632	0.5	L	RM	D	I	2	1	Prohibit

Functional Classes: C = collector, L = local

ROS Class: Recreation Opportunity Spectrum; RM: roaded-modified,

Traffic Service Level: C = passenger cars, not smooth, D = high clearance vehicles

Service Life: I – intermittent term service

Maintenance Level 1 = Maintenance is Basic Custodial Care.

Maintenance Level 2 = Maintenance is for High Clearance Vehicles.

Traffic Management Strategies:

Accept: Accept post harvest administrative and public traffic.

Prohibit: Prohibit motor vehicle use through implementation of a closure order.

All roads labeled “Accept” under Traffic Management Strategy, Post Harvest would remain open and would be available for ORV use. All other roads would be placed in storage. Roads in storage are not considered usable by normal vehicle traffic. Roads would be closed at the first practical point, either by tank trap at the beginning of the road, at the first stream crossing, or by official road closure order.

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Findings and Disclosures

Several of the laws and executive orders listed in Chapter 1 require project-specific findings or other disclosures. These are included here, and will also be included in the Record of Decision. They apply to all alternatives considered in detail in this Final EIS.

National Forest Management Act

All project alternatives fully comply with the 1997 Tongass Forest Plan and applicable Forest Service handbook and manual direction. This project incorporates all applicable Forest Plan Forest-wide Standards and Guidelines and management area prescriptions as they apply to the project area, and complies with Forest Plan goals and objectives. All required interagency review and coordination will be accomplished; new or revised measures resulting from this review will be incorporated.

The 1997 Forest Plan complies with all resource integration and management requirements of 36 CFR 219 (219.14 through 219.27). Application of Forest Plan direction for the Couverden project area ensures compliance at the project level. The National Forest Management Act (NFMA) limits the size of the harvest opening that may be created based on forest type. The maximum created opening allowed in the coastal Alaska western hemlock/Sitka spruce forest type is 100 acres. No proposed harvest unit in the Couverden project area would result in an opening larger than 100 acres. Specific NFMA findings pertaining to silvicultural systems are included in the project planning record.

Endangered Species Act

None of the alternatives is anticipated to have a direct, indirect, or cumulative effects on any threatened or endangered species in or outside the project area. Consultations with U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) have been initiated. A complete biological assessment is included in the planning record.

Tongass Timber Reform Act

Application of Forest Plan riparian standards and guidelines ensures that no commercial timber harvest will occur within 100 feet of any Class I stream or any Class II stream flowing directly into a Class I stream.

National Historic Preservation Act

Cultural resource surveys of varying intensities have been conducted, following inventory protocols approved by the Alaska State Historic Preservation Officer. Native communities have been contacted and public comment has been encouraged. The consultation and concurrence process with the State Historic Preservation Officer has been conducted. No significant effects on known cultural resources are anticipated.

Federal Cave Resource Protection Act

No known significant caves in the project area would be directly or indirectly affected by project activities. Forest Plan karst and caves standards and guidelines apply to areas known or suspected to contain karst resources.

Alaska National Interest Lands Conservation Act

An Alaska National Interest Lands Conservation Act (ANILCA) Section 810 subsistence evaluation was conducted. No significant restrictions on the abundance and distribution of subsistence resources in the project area are anticipated. Although some access restrictions and competition may occur during harvest, these are not expected to be significant. (See the Subsistence Report in the project planning record.)

Clean Water Act

Congress intended the Clean Water Act of 1972 (Public Law 92-500) as amended in 1977 (Public Law 95-217) and 1987 (Public Law 100-4) to protect and improve the quality of water resources and maintain their beneficial uses. Section 313 of the Clean Water Act and Executive Order 12088 of January 23, 1987, address federal agency compliance and consistency with water pollution control mandates. Agencies must be consistent with requirements that apply to “any governmental entity” or private person. Compliance is to be in line with “all Federal, State, interstate, and local requirements, administrative authority, and process and sanctions respecting the control and abatement of water pollution.”

The Clean Water Act (Sections 208 and 319) recognized the need for control strategies for nonpoint source pollution. The National Nonpoint Source Policy (December 12, 1984), the Forest Service Nonpoint Strategy (January 29, 1985), and the USDA Nonpoint Source Water Quality Policy (December 5, 1986) provide a protection and improvement emphasis for soil and water resources and water-related beneficial uses. Soil and water conservation practices (BMPs) were recognized as the primary control mechanisms for nonpoint source pollution on National Forest System lands. The Environmental Protection Agency supports this perspective in their guidance, “Nonpoint Source Controls and Water Quality Standards” (August 19, 1987).

The Forest Service must apply Best Management Practices that are consistent with the Alaska Forest Resources and Practices regulations to achieve Alaska Water Quality Standards. The site-specific application of BMPs, with a monitoring and feedback mechanism, is the approved strategy for controlling nonpoint source pollution as defined by Alaska’s Nonpoint Source Pollution Control Strategy (October 2000). In 1997, the State approved the BMPs in the Forest Service’s Soil and Water Conservation Handbook (FSH Handbook 2509.22, October 1996) as consistent with the Alaska Forest Resources and Practices Regulations. This Handbook is incorporated into the Tongass Land Management Plan.

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A discharge of dredge or fill material from normal silviculture activities such as harvesting for the production of forest products is exempt from Section 404 permitting requirements in the waters of the United States, including wetlands (404)(f)(1)(A). Forest roads qualify for this exemption only if they are constructed and maintained in accordance with BMPs to ensure that flow and circulation patterns and chemical and biological characteristics of the waters are not impaired (404)(f)(1)(E). The BMPs that must be followed are specified in 33 CFR 323.4(a). These specific BMPs have been incorporated into the Forest Service's Soil and Water Conservation Handbook.

Clean Air Act

Emissions anticipated from the implementation of any project alternative would be of short duration and are not expected to exceed state of Alaska ambient air quality standards (18 AAC 50).

Coastal Zone Management Act

The Forest Service has determined that the Couverden project area will affect the coastal zone, and that Forest Plan standards and guidelines and mitigation measures applicable to the Couverden project area meet or exceed the requirements of the state of Alaska Forest Resources and Practices Act. Therefore, the project is consistent to the maximum extent practicable with the enforceable policies of the Alaska Coastal Management Program (ACMP). Copies of this determination and supporting information will be provided to the State of Alaska Office of Program Management and Permitting for review as required by the ACMP MOU.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918 (amended in 1936 and 1972) prohibits the taking of migratory birds, unless authorized by the Secretary of Interior. The law provides the primary mechanism to regulate waterfowl hunting seasons and bag limits, but its scope is not just limited to waterfowl. Over 100 species of birds migrate from the other states and countries to Alaska to breed, nest, and fledge their young. Most of these birds fly to interior or northern Alaska, and only pass through the project area on the way to their breeding grounds. The migratory species that may stay in the area utilize most, if not all, of the habitats described in the analysis for breeding, nesting, and raising their young. The effects on these habitats were analyzed for this project.

Executive Order 11988

The numerous streams in the Couverden project area make it essentially impossible to avoid all floodplains during timber harvest and road construction. Forest Plan standards and guidelines for riparian areas exclude most commercial timber harvesting from floodplains. Roads may be constructed in or through floodplains subject to the design requirements of the BMPs. Effects on floodplains from project activities have been avoided or minimized as much as possible.

Executive Order 11990

Because wetlands are so extensive in the Couverden project area, it is not feasible to avoid all wetland areas. Wetland soils not meeting Forest Plan

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criteria for timber harvest suitability are excluded from the harvest base. Soil moisture regimes and vegetation on some wetlands may be altered in some harvest units; however, the affected wetlands will meet wetland classification and will still function as wetlands in the ecosystem.

Road construction across wetlands is permitted within Alaska. Such construction requires the filling-in of wetlands and creates permanent loss of wetland habitat. Effects to wetlands are minimized through the application of specific BMPs. Road construction through wetlands is avoided where possible.

Executive Order 12898 Implementation of any project alternative is not anticipated to cause disproportionate adverse human health or environmental effects to minority or low-income populations. (See also the ANILCA Section 810 findings.)

Executive Order 12962 With the application of Forest Plan standards and guidelines, including those for riparian areas, no significant adverse effects to freshwater or marine resources would occur. Post-project road closures could limit, to foot or permitted off-highway vehicle means, access to some recreational fishing opportunities; however, most recreational fishing throughout the Tongass occurs by boat in saltwater, and any adverse effects would be minimal.

Executive Order 13186 (Migratory Birds) None of the action alternatives is anticipated to have a significant, direct, indirect, or cumulative effect on any migratory bird species for this project area. There may be direct minor effects on individuals or small groups and their nests from the harvest or timber or the disturbance caused by harvest activities.

Energy Requirements and Conservation Potential of the Alternatives

The implementation of the proposed alternatives will require the expenditure of energy (consumption of fuel). The amount of energy used varies by alternative, based on the timber volume harvested, the type of harvest system used, the amount of road construction, and sale preparation and administration.

Fuel Consumption

Fuel Consumption requirements were estimated as follows:

♦ Timber Sale Preparation and Administration	1.56 gallons per mbf
♦ Cable Logging	2 gallons per mbf
♦ Helicopter Logging	8 gallons per mbf
♦ Load, Haul, Dump, and Tow	8 gallons per mbf
♦ Road Construction	4,000 gallons per mile
♦ Road Maintenance	20 gallons per mile

The estimated fuel consumption required for each alternative is displayed in Table 3-73.

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Table 3-73
Estimated Fuel Consumption by Alternative (Thousands of Gallons)

Activity	Alternative				
	2	3	4	5	6
Cable Logging	46.7	40.0	22.0	10.0	12.7
Helicopter Logging	31.9	0	31.5	0	0
Load, Haul, Dump, Tow	218.8	160.9	119.4	40.0	50.9
Road Construction	31.2	27.6	16.0	0	3.6
Road Maintenance	0.1	0.1	0.2	0.2	0.1
Timber Sale Prep. and Admin.	42.6	31.2	23.3	7.8	9.9
Total Consumption	371.3	259.8	212.4	58.0	77.2
Average Gallons per mbf	13.6	13.0	14.2	11.6	12.1

Unavoidable Environmental Effects

Although harvest units and roads were designed to avoid adverse consequences, and have included mitigation measures, some environmental impacts cannot be completely mitigated and would be expected to occur.

Air quality would diminish on a recurring, temporary basis due to the construction of roads, timber harvest, and hauling. Limbs and logging slash would be burned at sort yards intermittently throughout the logging periods, which would deposit minor amounts of particulate matter and smoke into the air.

Although BMPs are designed to protect soil and water, some potential for surface erosion, sediment production, channel erosion, and mass movement does exist. Road developments pose a risk of sediment production; however, the degree of risk posed by the proposed roads is not unusually high. Road locations are largely in stable terrain. Helicopter yarding in Alternatives 2 and 4 reduces the risks associated with road building. Sediment production could displace fish or result in a loss of habitat near stream crossings and temporarily affect the function of the freshwater system.

Increased human activity, both during and after logging, and loss of habitat, would result in impacts to fish and wildlife species, particularly those populations that have low numbers or are more sensitive to the presence of people. The habitat for old-growth associated species would be reduced. Travel corridors between old-growth blocks in adjacent watersheds would also be reduced in size, which may affect the ability of individuals to disperse and may limit the exchange of genetic material among local populations.

Affected Environment and Environmental Consequences 3

Short-term Uses and Long-term Productivity

The use of natural resources for long-term sustained yield is at the basis of National Forest management and direction. The proposed timber harvesting under the BMPs, Forest Plan Standards and Guidelines, and Forest Plan Land Use Designation (LUD) direction would not result in long-term loss in productivity.

Effects on Prime Farm Land, Range Land, and Forest Land

No prime farm land or range land would be adversely affected by the action alternatives. Forest land would maintain its productivity, except for those lands permanently occupied by roads built for long-term access for forest management.

Effects on Civil Rights, Women, and Minorities

There would be no adverse effects on civil rights, women, and/or minorities as a result of any of the alternatives.

There is no indication, nor have any comments been received, that would lead to the belief that any of the alternatives considered for the proposed project would impact any individual's civil rights. This conclusion tiers to the Economics and Social Environmental Analysis included in Chapter 3 of the Forest Plan.

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CHAPTER 4

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Glossary

Alaska National Interest Lands Conservation Act (ANILCA)

Passed by Congress in 1980, this legislation designated 14 National Forest wilderness areas in Southeast Alaska. Section 810 requires evaluations of subsistence impacts before changing the use of these lands.

Alaska Native Claims Settlement Act (ANCSA)

Approved December 18, 1971, ANCSA provides for the settlement of certain land claims of Alaska natives and for other purposes.

Allowable Sale Quantity (ASQ)

The maximum quantity of timber that may be sold each decade from suitable lands covered by the Forest Plan.

Anadromous Fish

Anadromous fish spend part of their lives in fresh water and part of their lives in salt water. Anadromous fish include pink, chum, coho, sockeye, king salmon, and steelhead trout. There are also anadromous Dolly Varden Char.

Beach Fringe Habitat

Habitat that occurs from the intertidal zone inland 1,000 feet, and islands of less than 50 acres.

Bedload

Sand, silt, and gravel, or soil and rock debris rolled along the bottom of a stream by the moving water.

Best Management Practice (BMP)

Practices used for the protection of water quality. BMPs are designed to prevent or reduce the amount of pollution from nonpoint sources or other adverse water quality impacts while meeting other goals and objectives. BMPs are standards to be achieved, not detailed or site-specific prescriptions or solutions. As defined in the USDA Forest Service's Soil and Water Conservation Handbook, BMPs are mandated for use in Region 10 under the Tongass Timber Reform Act.

Biological Diversity (Biodiversity)

The variety of life in all its forms and at all levels. This includes the various kinds and combinations of: genes; species of plants, animals, and microorganisms; populations; communities; and ecosystems. It also includes the physical and ecological processes that allow all levels to interact and survive. The most familiar level of biological diversity is at the species level, which is the number and abundance of plants, animals, and microorganisms.

Blowdown

See Windthrow.

Board Foot

A unit of wood measuring 12 inches by 12 inches by 1 inch (12"x12"x1"). One acre of commercial timber in Southeast Alaska yields on the average

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18,000 to 34,000 board feet per acre (ranging from 8,000 to 90,000 board feet per acre). One million board feet (mmbf) would be the volume of wood covering one acre two feet thick. One mmbf yields approximately enough timber to build 120 houses.

Bog

An undrained or imperfectly drained area with a vegetation complex composed of sedges, shrubs, and sphagnum mosses, typically with peat formation. See also Muskeg.

Braided Streams or Channels

A stream flowing in several dividing and reuniting channels resembling the strands of a braid, the cause of division being the obstruction by sediment deposited by the stream.

Buffer

An area around a resource where timber harvest is restricted or prohibited. For example, the Tongass Timber Reform Act requires that timber harvest be prohibited in an area no less than 100 feet from each side of all Class I streams and Class II streams which flow directly into Class I streams. This 100-foot area is known as a “stream buffer.”

Canopy

See Overstory.

Carrying Capacity

The maximum number of species that can be supported indefinitely by available resources in a given area.

Class I, II, III, IV, and Non-streams

See stream class.

Classified Roads

See Roads.

Clearcut

The harvesting in one cut of all trees on an area. The area harvested may be a patch, strip, or stand large enough to be mapped or recorded as a separate class in planning for sustained yield. Clearcut size on the Tongass National Forest is limited to 100 acres, except for specific conditions noted in the Alaska Regional Guide.

Coarse Canopy

Forest with high habitat structure (i.e., many tall, large-diameter, widely spaced trees). These stands are referred to as coarse canopy because they exhibit coarse-textured canopies (many large crowns and frequent canopy gaps).

Commercial Forest Land (CFL)

Productive forest land that is producing or capable of producing continuous crops of industrial wood and is not withdrawn from timber utilization by statute or administrative regulation. This includes areas suitable for management and generally capable of producing in excess of 20 cubic feet

per acre of annual growth or in excess of 8,000 board feet net volume per acre. It includes accessible and inaccessible areas.

Normal CFL: Timber that can be economically harvested with locally available logging systems. Composed of two categories:

Standard: Timber that can be economically harvested with locally available logging systems, such as highlead or short-span skyline.

Special: Timber that is in areas where special consideration is needed to protect other resources but can be harvested with locally available logging systems.

Non-standard CFL: Timber that cannot be harvested with locally available logging systems and would require the use of other logging systems such as helicopter or long-span skyline.

Commercial Thinning

Thinning a stand where the trees to be removed are large enough to sell.

Confluence

The point where two streams meet.

Connectivity

A measure of the extent that forest areas between or outside reserves provide habitat for breeding, feeding, dispersal, and movement.

Corridor

Connective links of certain types of vegetation between patches of suitable habitat that are necessary for certain species to facilitate movement of individuals between patches of suitable habitat. Also refers to transportation or utility right-of-way.

Cruise

Refers to the general activity of determining timber volume and quality, as opposed to a specific method.

Cultural Resources

See Heritage Resources.

Cumulative Effects

The impacts on the environment resulting from the addition of the incremental impacts of past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions occurring over time.

Debris Avalanche

The sudden movement downslope of the soil mantle; it occurs on steep slopes and is caused by the complete saturation of the soil from prolonged heavy rains.

Debris Flow

A general term for all types of rapid movement of debris downslope.

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Debris Torrents

Landslides that occur as a result of debris; avalanche materials which either dam a channel temporarily or accumulate behind temporary obstructions such as logs and forest debris.

Deer Winter Range

Locations that provide food and shelter for Sitka black-tailed deer under moderate to severe winter conditions. Usually associated with high volume old-growth forest at low elevations and south aspects.

Developed Recreation

Recreation that requires facilities that, in turn, result in concentrated use of an area, such as campgrounds and ski areas. Facilities in these areas might include roads, parking lots, picnic tables, toilets, drinking water, ski lifts, and buildings. See also Dispersed Recreation.

Diameter at Breast Height (dbh)

The diameter of a tree measured 4 feet 6 inches from the ground.

Diameter Limit

The harvest of trees above (or below) a specified dbh.

Direct Employment

The jobs that are immediately associated with a timber sale, including logging, sawmills, and pulp mills.

Dispersed Recreation

Recreational activities that are not confined to a specific place and are generally outside developed recreation sites. This includes activities such as scenic driving, hiking, backpacking, hunting, fishing, snowmobiling, horseback riding, cross-country skiing, and recreation in primitive environments. See also Developed Recreation.

Distance Zone

Areas of landscapes denoted by specified distances from the observer (foreground, middleground, or background). Used as a frame of reference in which to discuss landscape characteristics or management activities.

Diversity

The distribution and abundance of different plant and animal communities and species within an area.

Draft Environmental Impact Statement (DEIS or Draft EIS)

A statement of environmental effects for a major Federal action which is released to the public and other agencies for comment and review prior to a final management decision. Required by Section 102 of the National Environmental Policy Act (NEPA).

Ecosystem

A community of organisms and its physical setting. An ecosystem, whether a fallen log or an entire watershed, includes resident organisms, non-living components such as soil nutrients, inputs such as rainfall, and outputs such as organisms that disperse to other ecosystems.

Effects

Effects may be ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historical, cultural, economic, or social and may be direct, indirect, or cumulative.

Direct Effects: Results of an action occurring when and where the action takes place.

Indirect Effects: Results of an action occurring at a location other than where the action takes place and/or later in time, but in the reasonably foreseeable future.

Cumulative Effects: See Cumulative Effects

Endangered Species

A species of plant or animal that is in danger of extinction throughout all or a significant portion of its range. Plant or animal species identified by the Secretary of the Interior as endangered in accordance with the 1973 Endangered Species Act (ESA). See also Threatened Species, Sensitive Species.

Erosion

The wearing away of the land surface by running water, wind, ice, gravity, or other geological activities.

Escapement

Adult anadromous fish that escape from all causes of mortality (human-caused or natural) to return to streams to spawn.

Estuary

For the purpose of this EIS process, estuary refers to the relatively flat intertidal and upland areas generally found at the heads of bays and mouths of streams. They are predominantly mud and grass flats and are unforested except for scattered spruce or cottonwood.

Even-aged Stand Management

Management that results in the creation of stands in which trees of essentially the same age grow together. Clearcut, shelterwood, and other tree-cutting methods produce even-aged stands. See also Uneven-aged Management.

Executive Order

An order issued by the President of the United States that has the force of law.

Falldown

The difference between planned or scheduled harvest and that which is attained after implementation.

Final Environmental Impact Statement (FEIS or Final EIS)

The final version of the statement of environmental effects required for major federal actions under Section 102 of the National Environmental Policy Act. It is a revision of the Draft EIS in response to public and agency

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comments. The decisionmaker chooses which alternative to select from the Final EIS, and subsequently issues a Record of Decision (ROD).

Floodplain

The lowland and relatively flat areas joining inland and coastal waters including debris cones and flood-prone areas of offshore islands; generally including that area subject to a 1 percent (100-year recurrence) or greater chance of flooding in any given year.

Forb

Any herbaceous plant that is not a grass or grass-like. Includes plants that are commonly called weeds or wildflowers.

Forest Land

Lands currently supporting or capable of supporting forests at a density of 10 percent crown closure or better. Includes all areas with forest cover, including old growth and second growth, and both commercial and noncommercial forest land.

Forest Plan

The Tongass Land Management Revision signed in 1997. This is the 10-year land allocation plan for the Tongass National Forest that directs and coordinates planning, the daily uses, and the activities carried out within the forest.

Forested Habitat

All areas with forest cover. Used in this EIS to represent a general habitat zone.

Forested Wetland

A wetland whose vegetation is characterized by an overstory of trees that are 20 feet or taller.

Fragmentation

An element of biological diversity that describes the natural condition of habitats in terms of the size of discrete habitat blocks or patches, their distribution, the extent to which they are interconnected, and the effects of management on these natural conditions. Also the process of reducing the size and connectivity of stands within a forest.

Geographic Information System (GIS)

An information processing technology to input, store, manipulate, analyze, and display spatial and attribute data to support the decision-making process. It is a system of computer maps with corresponding site-specific information that can be electronically combined to provide reports and maps.

Group Selection

Small groups of trees up to 2 acres in size are harvested.

Habitat

The sum total of environmental conditions of a specific place that is occupied by an organism, population, or community of plants or animals.

Habitat Capability

An estimate of the number of healthy individuals of a species that a habitat can sustain.

Habitat Suitability Index (HSI)

A value assigned to a unit of land using a computerized model that relates vegetative and geographic characteristics (e.g., stand volume, proximity to a stream or cliff, slope, aspect, etc.) to the land unit's value for a particular wildlife species. Values range from 0 to 1, with 1 being the best. Habitat Capability Models (HCM) used to generate HSIs were developed by interagency teams of biologists using the best available information including research results and best professional judgment.

Heritage Resources

Also known as Cultural Resources. Historic or prehistoric objects, sites, buildings, structures, and their remains, resulting from past human activities.

Important Subsistence Use Area

Important Subsistence Use Areas include the "most-reliable" and "most often hunted" categories from the Tongass Resource Use Cooperative Survey (TRUCS) and from subsistence survey data from ADF&G, the University of Alaska, and the Forest Service, Region 10. Important use areas include both intensive and extensive use areas for subsistence harvest of deer, furbearers, and salmon.

Indirect Employment

The jobs in service industries that are associated with a timber sale, including suppliers of logging and milling equipment. See also Direct Employment.

Infrastructure

The facilities, utilities, and transportation systems needed to meet public and administrative needs.

Inoperable Timber

Timber that cannot be harvested by any proven method because of potential resource damage, extremely adverse economic considerations, or physical limitation.

Interdisciplinary Team (IDT)

A group of people with different backgrounds assembled to research, analyze, and write a project EIS. The team is assembled out of recognition that no one scientific discipline is sufficiently broad enough to adequately analyze a proposed action and its alternatives.

Irretrievable Commitments

Loss of production or use of renewable natural resources for a period of time. For example, timber production from an area is irretrievably lost during the time an area is allocated to a no-harvest prescription; if the allocation is changed to allow timber harvest, timber production can be resumed. The production lost is irretrievable, but not irreversible.

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Irreversible Commitments

Decisions causing changes that cannot be reversed. For example, if a roadless area is allocated to allow timber harvest, and timber is actually harvested, that area cannot at a later time be allocated to wilderness. Once harvested, the ability of the area to meet wilderness criteria has been irreversibly lost. Often applies to nonrenewable resources such as minerals and cultural resources.

Issue

A point, matter, or section of public discussion of interest to be addressed or decided.

Karst

A type of topography that develops in areas underlain by soluble rocks, primarily limestones. Sinkholes, collapsed channels, vertical shafts, and caves are formed when the subsurface layer dissolves. Areas on which karst has developed are said to display “karst topography.”

Landscape-level Diversity

A function of the spatial distribution of habitat types across a large area such as a Project Area or ecological province.

Landslides

The moderately rapid to rapid downslope movement of soil and rock materials that may or may not be water-saturated.

Land Use Designation (LUD)

A defined area of land specific to which management direction is applied by the Forest Plan.

Large Woody Debris (LWD)

Any large piece of relatively stable woody material having a diameter greater than 10 centimeters and a length greater than one meter that intrudes into the stream channel.

Logging Camp

A temporary facility established to house industry and Forest Service personnel while timber harvest occurs in the area.

Log Transfer Facility (LTF)

A facility that is used for transferring commercially harvested logs to and from a vessel or log raft or the formation of a log raft. It is wholly or partially constructed in waters of the United States and siting and construction are regulated by the 1987 Amendments to the Clean Water Act. Formerly termed “terminal transfer facility.”

Long Skyline

Long skyline logging systems specified in the unit cards are defined as cable yarding settings with external yarding distances greater than 1,000 feet and settings where extended lengths of skyline are required to obtain deflection and lift. This includes settings with external yarding distances less than 1,000 feet that require skyline lengths greater than 1,200 feet. These settings are designed for 70-foot to 100-foot tower yarders.

The definition of long skyline is different for the NEAT economic analysis. For NEAT, long skyline is defined as settings that have external yarding distances greater than 1,300 feet.

mbf

A thousand board feet of net sawlog and utility volume.

mmbf

A million board feet of net sawlog and utility volume.

Management Indicator Species (MIS)

Species that are used to monitor the effects of planned management activities on viable populations of fish and wildlife during a planning process. The population changes of these species are believed to best indicate the effects of land management.

Management Prescriptions

Management practices and intensity selected and scheduled for application on a specific area (e.g., a land use designation) to attain multiple-use and other goals and objectives.

Marine Access Point

A place, such as an LTF, where a road system may be accessed by a boat or barge using the Alaska Marine Highway.

Maritime Climate

Weather conditions controlled by an oceanic environment characterized by small annual temperature ranges and high precipitation.

Market Pond Value

Also known as pond log value. Selling value minus manufacturing costs. Pond log values are the price a timber buyer would pay for a log at the mill site.

Mass Movement

The downslope movement of a block or mass of soil. This usually occurs under conditions of high-soil moisture and does not include individual soil particles displaced as surface erosion.

Mass Movement Index (MMI)

Rating used to group soil map units that have similar properties with respect to the stability of natural slopes. It includes the following: MMI1 = Low potential for mass movement; MMI2 = Moderate potential for mass movement; MMI3 = High potential for mass movement; and MMI4 = Very high potential for mass movement.

Memorandum of Understanding (MOU)

A legal agreement between the Forest Service and other agencies resulting from consultation between agencies that states specific measures the agencies will follow to accomplish a large or complex project. A MOU is not a fund obligating document.

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Mineral Soils

Soils consisting predominantly of, and having its properties determined by, mineral matter.

Minerotrophic Sites

True fens that receive water which passes through mineral soil. These areas generally have a high groundwater level and occupy a low point of relief in a basin.

Mitigation

Measures designed to counteract environmental impacts or to make impacts less severe. These measures may include avoiding an impact by not taking a certain action or part of an action, minimizing an impact by limiting the degree or magnitude of an action and its implementation; rectifying the impact by repairing, rehabilitating, or restoring the affected environment; reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or compensating for the impact by replacing or providing substitute resources or environments.

Mixed Conifer

In Southeast Alaska, mixed conifer stands usually consist of western hemlock, mountain hemlock, Alaska yellowcedar, Western redcedar, and Sitka spruce species. Shorepine may occasionally be present.

Monitoring

A process of collecting information to evaluate whether or not objectives of a project and its mitigation plan are being realized. Monitoring can occur at different levels: to confirm whether mitigation measures were carried out in the matter called for (Implementation Monitoring); to confirm whether mitigation measures were effective (Effectiveness Monitoring); or, to validate whether overall goals and objectives were appropriate (Validation Monitoring). Different levels call for different methods of monitoring.

Multiple-aged Stands

An intermediate form of stand structure between even and uneven-aged stands. These stands generally have two or three distinct tree canopy levels occurring within a single stand.

Multiple Entry

More than one stand or land treatment activity during a rotation of a stand or area.

Muskeg

In Southeast Alaska, a type of bog or fen that has developed over thousands of years in depressions or flat areas on gentle to steep slopes. Also called peatlands.

National Environmental Policy Act (NEPA)

An act, passed by Congress in 1969, that declared a national policy to encourage productive harmony between humans and their environment to promote efforts that will prevent or eliminate damage to the environment and the biosphere and stimulate the health and welfare of humans to enrich the understanding of the ecological systems and natural resources important to

the nation and to establish a Council on Environmental Quality. This act requires the preparation of environmental impact statements for federal actions that are determined to be of major significance.

National Forest Management Act (NFMA)

A law passed in 1976 that amends the Forest and Rangeland Renewable Resources Planning Act that requires the preparation of forest plans, regional guides, and regulations to guide that development.

National Wild and Scenic River System

Rivers with outstanding scenic, recreational, geological, fish and wildlife, historic, cultural, or other similar values designated by Congress under the Wild and Scenic Rivers Act of 1968 and amended in 1986, for preservation of their free-flowing condition. May be classified and administered under one or more of the following categories: Wild, Scenic, and/or Recreational.

Net Sawlog Volume

Trees suitable in size and quality for producing logs that can be processed into lumber. In Southeast Alaska, depending on the market, the volume may be processed as pulp or lumber.

No Action Alternative

The most likely condition expected to exist in the future if current management direction were to continue unchanged.

Noncommercial Forest Land

Land with more than 10 percent cover of commercial forest tree species but not qualifying as commercial forest land (CFL).

Obliteration

Obliteration includes stabilization and restoration measures such as blocking the entrance to a road, installing waterbars, removing culverts, restoring vegetation, removing fill where appropriate, and re-establishing former drainage patterns.

Old-growth Forest

Ecosystems distinguished by the later stages of forest stand development that differs significantly from younger forests in structure, ecological function, and species composition. Old-growth forest is characterized by a patchy, multi-layered canopy; trees that represent many age classes; large trees that dominate the overstory, large standing dead (snags) or decadent trees; and higher accumulations of large down woody material. The structure and function of an old-growth ecosystem will be influenced by its stand size and landscape position and context.

Organic Soils

Soils that contain a high percentage (generally greater than 20 to 30 percent) of organic matter throughout the soil depth.

Overstory

The portion of trees in a forest that forms the uppermost layer of foliage, usually formed by the tallest trees. Also called the canopy.

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Partial cutting

Method of harvesting trees (not clearcutting) where any number of live stems are left standing in any of various spatial patterns. Can include seed tree, shelterwood, or other methods.

Patch

A non-linear surface area differing in appearance from its surroundings.

Planning Record

A detailed, formal system of records that document the planning process for an EIS. The record contains data, maps, reports, planning process information, and results of public participation in the planning process. The Planning Record documents the decisions and activities that resulted in the Final EIS and ROD.

Plant Communities

Aggregations of living plants having mutual relationships among themselves and to their environment.

Population Viability

Ability of a population to sustain itself over time. See viable population.

Precommercial Thinning

The practice of removing some of the trees of less than marketable size from a stand in order to achieve various management objectives.

Process Group

A combination of similar stream channel types based on major differences in landform, gradient, and channel shapes.

Productive Old Growth (POG)

Old-growth forest capable of producing at least 20 cubic feet of wood fiber per acre per year, or having greater than 8,000 board feet per acre.

Public Participation

Meetings, conferences, seminars, workshops, tours, written comments, responses to survey questionnaires, and similar activities designed and held to obtain comments from the public about Forest Service activities.

Record of Decision (ROD)

A document separate from but associated with an EIS that states the decision, identifies all alternatives, specifying which were environmentally preferable, and states whether all practicable means to avoid environmental harm from the alternatives have been adopted, and if not, why not.

Recreation Opportunity Spectrum (ROS)

The system for planning and managing recreation resources that categorizes recreation opportunities into six classes. Each class is defined in terms of the degree to which it satisfies certain recreation experience needs based on the extent to which the natural environment has been modified, the type of facilities provided, the degree of outdoor skill needed to enjoy the area, and the relative density of recreation use. The classes are:

Primitive: An essentially unmodified natural environment of fairly large size. Interaction between users is very low, and evidence of other users is minimal. The area is managed to be essentially free from evidence of human-induced restrictions and controls. Motorized use is generally not permitted.

Semi-Primitive Nonmotorized: A natural or natural-appearing environment of moderate to large size. Concentration of users is low, but there is often evidence of other users. The area is managed to minimize on-site controls and restrictions. Use of local roads for recreational purposes is not allowed.

Semi-Primitive Motorized: A natural or natural-appearing environment of moderate to large size. Interaction between users is low, but there is often evidence of other users. The area is managed to minimize on-site controls and restrictions. Local roads used for other resource management activities may be present.

Roaded Natural: A natural-appearing environment with moderate evidence of the sights and sounds of humans. Such evidence usually harmonizes with the natural environment. Interaction between users may be moderate to high with evidence of other users prevalent. Motorized use is allowed.

Roaded Modified: A natural environment that has been substantially modified particularly by vegetation manipulation. There is strong evidence of roads and/or highways. Frequency of contact is low to moderate.

Rural: A natural environment that has been substantially modified by development of structures and vegetative manipulation. Structures are readily apparent and may range from scattered to small dominant clusters. Sights and sounds of humans are readily evident, and the interaction between users is often moderate to high.

Reforestation

The natural or artificial restocking of an area with trees.

Regeneration

The process of establishing a new crop of trees on previously harvested land.

Rehabilitation

Actions taken to protect or enhance site productivity, water quality, or other values for a short period of time.

Reserve Trees

Merchantable or submerchantable trees and snags that are left within the harvest unit to provide biological habitat components over the next management cycle.

Resident Fish

Fish that are not anadromous and that reside in fresh water on a permanent basis. Resident fish include non-anadromous Dolly Varden char and cutthroat trout.

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Resource Values

The tangible and intangible worth of forest resources.

Responsible Official

The Forest Service employee who has the delegated authority to make a specific decision.

Retention

A visual quality objective which provides for management activities that are not visually evident to the casual observer. The term is also used to describe the trees retained in a stand after harvest.

Revegetation

The re-establishment and development of a plant cover. This may take place naturally through the reproductive processes of the existing flora or artificially through the direct action of reforestation or reseeding.

Riparian Ecosystems

A transition between the aquatic ecosystem and the adjacent terrestrial ecosystem; identified by soil characteristics or distinctive vegetation communities that require free or unbound water.

Riparian Management Area

Land areas delineated in the Forest Plan to provide for the management of riparian resources. Specific standards and guidelines, by stream process group, are associated with riparian management areas. Riparian management areas may be modified by watershed analysis.

Road Maintenance Level

The level of service provided by, and maintenance required for, a specific road consistent with road management objectives and maintenance criteria (FSH 7709.58, Section 12.3).

Maintenance Level 1: Assigned to intermittent service roads during the time they are closed to vehicular traffic. The closure period is one year or longer. Basic custodial maintenance is performed.

Maintenance Level 2: Assigned to roads open for use by high-clearance vehicles. Passenger car traffic is not a consideration.

Maintenance Level 3: Assigned to roads open and maintained for travel by the prudent driver in a standard passenger car. User comfort and convenience are not considered priorities.

Maintenance Level 4: Assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds.

Maintenance Level 5: Assigned to roads that provide a high degree of user comfort and convenience. Normally, roads are double-laned and paved, or aggregate surfaced with dust abatement.

Road Management Objective (RMO)

Defines the intended purpose of an individual road based on Management Area direction and access management objectives. RMOs contain design

criteria, operation criteria, and maintenance criteria. Long-term and short-term roads have RMOs.

Roads

Classified: Roads usually developed and operated for long-term land and resource management purposes to constant service.

Unclassified: Roads that are not needed for, and not managed as part of, the Forest transportation system. These include unplanned roads, abandoned roads, off-road vehicle tracks that have not been designated as a trail, and roads no longer under permit or authorization.

Temporary: Roads authorized by contract, permit, lease, or emergency operation, not intended to be part of the forest transportation system and not necessary for long-term resource management. For National Forest timber sales, temporary roads are constructed to harvest timber on a one-time basis. These logging roads are not considered part of the permanent Forest transportation network and have stream crossing structures removed, erosion measures put into place, and the road closed to vehicular traffic after harvest is completed.

Roadless Area

An area of undeveloped public land identified in the roadless area inventory of the Forest Plan within which there are no improved roads maintained for travel by means of motorized vehicles intended for highway use.

Rotation

The planned number of years (approximately 100 years in Alaska) between the time that a forest stand is regenerated and its next cutting at a specified stage of maturity.

Sawlog

That portion of a tree that is suitable in size and quality for the production of dimension lumber, collectively known as sawtimber.

Scheduled Timber Harvests

Timber harvests done as part of meeting the allowable sale quantity.

Scoping Process

Early and open activities used to determine the scope and significance of a proposed action, what level of analysis is required, what data is needed, and what level of public participation is appropriate. Scoping focuses on the issues surrounding the proposed action and the range of actions, alternatives, and impacts to be considered in an EA or an EIS.

Scrub-Shrub Wetland

Wetland dominated by woody vegetation less than 20 feet tall. The species include true shrubs, young trees, and trees or shrubs that are small or stunted because of environmental conditions. In Southeast Alaska, this includes forested lands where trees are stunted because of poor soil drainage.

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Second-growth Forest

Forest growth that has become established following some disturbance such as cutting serious fire, or insect attack; even-aged stands that will grow back on a site after removal of the previous timber stand.

Sediment

Solid material, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by streams, mass movement, glaciers, or wind and has come to rest on the earth's surface.

Seedling/Sapling Stage

The stage following timber harvest when most of the colonizing tree and shrub seedlings become established. Usually 1 to 25 years.

Selective Cutting

The annual or periodic removal of trees (particularly mature trees), individually or in small groups from an uneven-aged forest to realize the yield and establish a new crop of irregular constitution.

Sensitive Species

Plant and animal species which are susceptible or vulnerable to activity impacts or habitat alterations. Those species that have appeared in the Federal Register as proposed for classification or are under consideration for official listing as endangered or threatened species, that are on a nonofficial State list, or that are recognized by the regional forester as needing special management on National Forest System lands to prevent placement on Federal or State lists.

Shade Tolerance

Tree species that have physiological growth processes adapted to shaded environments. Western hemlock is a shade tolerant species. Other tree species tolerance to shade may range from tolerant to intolerant.

Short Skyline

Short skyline logging systems specified in the unit cards are defined as cable yarding settings with external yarding distances of 1,000 feet or less that do not require extended skyline reaches outside of the setting. These settings are suitable for swing yarders using a running skyline system or live skyline system. Please refer to the definition for Long Skyline.

Significant

Specific legal term under the National Environmental Policy Act (NEPA) that requires considerations of both context and intensity in evaluating impacts.

Silvicultural Prescription

A written technical document which provides detailed implementation direction about methods, techniques, timing, and monitoring or vegetative treatments. A prescription is prepared after a preferred treatment alternative has been selected, but before the project is implemented. A prescription is prepared by a silviculturist who uses interdisciplinary input to best achieve established objectives, direction, and requirements for land managed by the USDA Forest Service.

Silviculture

The art, science and practice of controlling the establishment, composition, structure and growth of trees and other vegetation in forest stands.

Site Index

A measure of the relative productive capacity for tree growth of an area. Measurement of site index is based on height of dominant trees in a stand at a given age.

Site Productivity

Production capability of specific areas of land.

Skyline Logging System

A system of cable logging in which all or part of the weight of the logs is supported during logging by a suspended cable.

Slash

Debris left over after a logging operation (i.e., limbs, bark, broken pieces of logs).

Smolt

A juvenile salmon, trout, or Dolly Varden migrating to the ocean and undergoing physiological changes to adapt its body from a freshwater to a saltwater environment.

Snag

A standing dead tree, usually greater than 5 feet tall and 6 inches in diameter at breast height.

Soil Productivity

Capacity of soil to produce plant growth due to the chemical, physical, and biological properties of the soil.

Spawning Area

The available area in a stream course which is suitable for the deposition and incubation of salmon or trout eggs.

Split Yarding

The process of separating the direction of timber harvest yarding into opposite directions.

Stand (Tree Stand)

A group of trees occupying a specific area and sufficiently uniform in composition, age arrangement, and condition as to be distinguishable from the forest in adjoining areas.

Stand-level Diversity

The diversity within specific habitats or limited land areas as measured by number of species present (species richness) or structural complexity of a given habitat type.

State Historic Preservation Officer (SHPO)

State appointed official who administers Federal and State programs for cultural resources.

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Stocking

The degree of occupancy of land by trees as measured by basal area or number of trees and as compared to a stocking standard; that is, the basal area or number of trees required to fully use the growth potential of the land.

Storage

Placing a road in storage includes such activities as removing culverts and installing waterbars; however, the roadbed would be mostly left intact and could be reconditioned for future use.

Stream Classes

A mapping unit that displays an identified value for aquatic resources. It is a mechanism for carrying out aquatic resource management policy. Sometimes referred to as an Aquatic Habitat Management Unit.

Class I: Streams and lakes with anadromous or adfluvial fish habitat; or high quality resident fish waters, or habitat above fish migration barriers known to be reasonable enhancement opportunities for anadromous fish.

Class II: Streams and lakes with resident fish or fish habitat and generally steep (6 to 25 percent or higher) gradients where no anadromous fish occur, and otherwise not meeting Class I criteria.

Class III: Perennial and intermittent streams that have no fish populations or fish habitat, but have sufficient flow or sediment and debris transport to directly influence downstream water quality or fish habitat capability. For streams less than 30 percent gradient, special care is needed to determine if resident fish are present. Streams are Class III streams if they have the following:

- ♦ Bankfull width greater than 1.5 meters (5 feet), and
- ♦ Channel incision greater than 5 meters (15 feet).

Streams that do not meet the above criteria may be classified as Class III streams based on a professional interpretation of stream characteristics. The following list contains characteristics that may indicate a Class III stream:

- a. Steep side-slopes containing mobile fine sediments, sand deposits, or deep soils
- b. Very steep gradient (greater than 35 percent slope)
- c. Recently transported bedload or debris (especially if deposited outside high water mark)
- d. Recent channel erosion or scour
- e. Absence of moss or other vegetation in channel
- f. Bedload rounded and bright (as opposed to angular and dull)
- g. High water width greatly exceeds current wetted width

- h. Sediment deposits stored amongst debris that could be readily transported if debris shifts.

Class IV: Other intermittent, ephemeral, and small perennial channels with insufficient flow or sediment transport capabilities to directly influence downstream water quality or fish habitat capability. Class IV streams do not have the characteristics of Class I, II, or III streams, and have a bankfull width of at least 0.3 meters (1 foot). Incision depth (meters) may be determined from side-slope angle and length (22.32 – Exhibit 01). Incisions from 3 to 5 meters in depth may be categorized as either Class III or Class IV streams depending on the other stream characteristics.

Structural Diversity

The diversity of forest structure, both vertically and horizontally, which provides for variety of forest habitats such as logs and multi-layered forest canopy for plants and animals.

Stumpage

The value of timber as it stands uncut in terms of dollar value per thousand board feet.

Subsistence Use

The customary and traditional uses by rural Alaskan residents of wild renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of nonedible byproducts of fish and wildlife resources taken for personal or family consumption; for barter or sharing, for personal or family consumption; and for customary trade.

Subsistence Use Area

Important Subsistence use areas include the “most reliable” and “most often hunted” categories from the Tongass Resource Use Cooperative Survey (TRUCS) and from subsistence survey data from ADF&G, the University of Alaska, and the Forest Service Region 10. Important use areas include both intensive and extensive use areas for subsistence harvest of deer, furbearers, and salmon.

Substantive Comment

A public comment that provides factual information, professional opinion, or informed judgment germane to the action being proposed.

Succession

The ecological progression of community change over time, characterized by displacements of species leading to a relatively stable climax community.

Suitability

An evaluation based upon a resource’s potential use within proposed management activities.

Suitable Forestland

Commercial forestland identified as having both the biological capability and availability to produce industrial wood products.

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Sustained Yield

The amount of renewable resources that can be produced continuously at a given intensity of management.

Temporary Roads

See Roads.

Tentatively Suitable Forestland

Forest land that is producing or is capable of producing crops of industrial wood and (a) has not been withdrawn by Congress, the Secretary of Agriculture or the Chief of the Forest Service; (b) existing technology and knowledge is available to ensure timber production without irreversible damage to soils productivity or watershed conditions; (c) existing technology and knowledge, as reflected in current research and experience, provides reasonable assurance that it is possible to restock adequately within 5 years after final harvest; and (d) adequate information is available to project responses to timber management activities.

Thinning

The practice of removing some of the trees in a stand so that the remaining trees will grow faster due to reduced competition for nutrients, water, and sunlight. Thinning may also be done to change the characteristics of a stand for wildlife or other purposes. Thinning may be done at two different stages: precommercial and commercial.

Threatened Species

A species of plant or animal likely to become endangered within the foreseeable future throughout all or a significant portion of its range, as defined in the Endangered Species Act of 1973, and which has been designated in the Federal Register by the Secretary of the Interior as a threatened species. See also Endangered Species, Sensitive Species.

Tiering

Eliminating repetitive discussion of the same issue by incorporating by reference. The general discussion in an EIS of broader scope (e.g., this document is tiered to TLMP, as amended).

Timber Appraisal

Establishing the fair market value of timber by taking the selling value minus manufacturing costs, the cost of getting logs from the stump to the manufacturer, and an allowance for profit and risk.

Timber Classification

Forested land is classified under each of the land management alternatives according to how it relates to the management of the timber resource. The following are definitions of timber classification used for this purpose:

Nonforest: Land that has never supported forests and land formerly forested where use for timber production is precluded by development for other uses.

Forest: Land at least 10-percent stocked (based on crown cover) by forest trees of any size, or formerly having had such tree cover and not currently developed for nonforest use.

Unsuitable: Forest land withdrawn from timber utilization by statute or administrative regulation (for example, wilderness), or identified as inappropriate for timber production in the Forest planning process.

Commercial forest: Forest land tentatively suitable for the production of continuous crops of timber and that has not been withdrawn.

Timber Entry

A term used to refer to how far into the timber rotation an area is on the basis of acreage harvested. For example, if an area is being managed for 3 entries over a 100-year rotation, the first entry would be completed when one-third (approximately 33 percent) of the available acreage is harvested (usually in 30-40 years); the second entry would be completed when two-thirds (approximately 66 percent) of the available acreage is harvested (usually 60-70 years); the third entry would be completed when all of the available acreage is harvested (at the end of the rotation).

Timber Harvest Unit

An area within which Forest Service specifies for harvest all or part of the timber.

Tongass Land and Resource Management Plan

The 10-year land allocation plan for the Tongass National Forest that directs and coordinates planning and the daily uses and activities carried out within the forest signed in 1997. See Forest Plan.

Tongass Resource Use Cooperative Survey (TRUCS)

A compilation of data on subsistence uses for evaluating the effects of the proposed action in this EIS.

Traffic Service Levels

Traffic characteristics and operating conditions that are used in setting road maintenance levels.

Unclassified Roads

See Roads.

Understory

The trees and shrubs in a forest growing under the main crown canopy or overstory.

Uneven-age Management

The application of a combination of actions needed to simultaneously maintain continuous high-forest cover, recurring regeneration of desirable species, and the orderly growth and development of trees through a range of diameter or age classes to provide a sustained yield of forest products. Cutting is usually regulated by specifying the number or proportion of trees of particular size to retain within each area, thereby maintaining a planned distribution of size classes.

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Unsuitable

Forest land withdrawn from timber utilization by statute or administrative regulation (e.g., wilderness), or identified as not appropriate for timber production in the forest planning process.

Utility Logs

Those logs that do not meet sawlog grade but are suitable for production of firm usable pulp chips.

Value Comparison Unit (VCU)

Areas which generally encompass a drainage basin containing one or more large stream systems; boundaries usually follow easily recognizable watershed divides. Established to provide a common set of areas where resource inventories could be conducted and resource interpretations made.

Viable Population

The number of individuals in a species required to ensure the continued long-term existence of the population in natural, self-sustaining populations and adequately distributed throughout the region.

Viewshed

An expansive landscape or panoramic vista seen from a road, marine waterway, or specific viewpoint.

Visual Absorption Capability (VAC)

An estimate of the relative ability of a landscape to absorb alteration yet retain its visual integrity.

Visual Quality Objective (VQO)

Measurable standards reflecting five different degrees of landscape alteration based upon a landscape's diversity of natural features and the public's concern for high scenic quality. The five categories of VQOs are:

Preservation: Permits ecological changes only. Applies to wilderness areas and other special classified areas.

Retention: Provides for management activities that are not visually evident; requires reduction of contrast through mitigation measures either during or immediately after operation.

Partial Retention: Management activities remain visually subordinate to the natural landscape. Mitigation measures should be accomplished within one year of project completion.

Modification: Management activities may visually dominate the characteristics landscape. However activities must borrow from naturally established form line color and texture so that its visual characteristics resemble natural occurrences within the surrounding area when viewed in the middleground distance.

Maximum Modification: Management activities may dominate the landscape. Mitigation measures should be accomplished within five years of project completion.

V-notch

A deeply cut valley along some waterways, generally in steep, mountainous terrain, that would look like a “V” from a frontal view.

Volume

Stand volume based on standing net board feet per acre by Scribner Rule.

Volume Class

Classification system used to differentiate timber stands into similar average volume per acre categories.

Volume Strata

Divisions of old-growth timber volume derived from the interpreted timber type data layer (TIMTYP) and the common land unit data layer (CLU). Three volume strata (low, medium, and high) are recognized in the Forest Plan for each Administrative Area.

Watershed

That area that contributes water to a drainage or stream; portion of a forest in which all surface water drains to a common point. Can range from a few tens of acres that drain a single small intermittent stream to many thousands of acres for a stream that drains hundreds of connected intermittent and perennial streams.

Wetland

Areas that are inundated by surface or groundwater frequently enough to support vegetation that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, river overflows, mudflats, and natural ponds.

Wildlife Analysis Area (WAA)

Alaska Department of Fish and Game (ADF&G) administrative designation of an area that includes one or several Value Comparison Units (VCUs) for wildlife analysis and regulating wildlife populations.

Windfirm

Configuration of harvest units so as not to create an opening which exposes the adjacent stand of timber to the direction of the major prevailing storm wind (southeast).

Windthrow

The act of trees being uprooted, blown down, or broken off by storm winds. Three types of windthrow include: endemic where individual trees are blown over, catastrophic where a major windstorm can destroy hundreds of acres, and management related where the clearing of trees in an area makes the adjacent standing trees vulnerable to windthrow.

Yarding

Hauling timber from the stump to a collection point.

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Distribution List

Copies of the Final EIS were sent to the following agencies, organizations, and persons listed below.

Agencies

Alaska Department of Fish and Game (ADF&G)
 Phil Mooney
 Division of Habitat & Restoration, Bill Hanson
 Division of Subsistence, Mike Turek
 Commissioner, Frank Rue
 Habitat and Restoration Division
 Tom Paul
 Kim Titus
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Alaska Cooperative Extension
 University of Alaska, Tony Nakazawa

Alaska Department of Commerce and Economic Development
 Division of Tourism

Alaska Department of Environmental Conservation, Kevin Hanley
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 Division of Forestry
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 Office of History and Archaeology, Judy Bittner

Alaska Department of Transportation & Public Facilities
 Commissioner, Joe Perkins

Alaska State Office of Housing & Urban Development, Environmental Officer

Alaska State Troopers, Division of Fish and Wildlife Protection, Sergeant Mike Fox

Department of Defense, Deputy Asst. Secretary of Defense

Federal Aviation Administration
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 Steve Turner

Federal Highway Administration
 Western Region, Regional Administrator

Federal Railroad Administration
 Environmental Division, P-14, Office of Transportation & Regulatory Affairs
 Research & Special Program Administration

Federal Energy Regulatory Commission, Environmental Compliance Branch,
 Advisor on Environmental Quality

Interstate Commerce Commission, Chief, Energy & Environment

NOAA Fisheries, Protected Resources Management Div., Regional Administrator

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Small Business Development Center
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Ketchikan Office
Juneau Center Director, Jackie Stewart
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TNF, Environmental Coordinator, Larry Lunde
TNF, Petersburg Supervisors Office, Land Management Planning
TNF, Craig Ranger District, District Ranger
TNF, Petersburg Ranger District, District Ranger
TNF, Ketchikan-Misty Ranger District, District Ranger
TNF, Yakutat Ranger District, District Ranger
TNF, Juneau Ranger District, District Ranger
TNF, Hoonah Ranger District, District Ranger
TNF, Sitka Ranger District, District Ranger
TNF, Thorne Bay Ranger District, District Ranger
TNF, Wrangell Ranger District, District Ranger
Chugach National Forest, Forest Supervisor
USDA APHIS PPD/EAD, Deputy Director
USDA National Resources Conservation Service, National Environmental Coordinator
USDA National Agricultural Library, Head Acquisitions and Serial Branch
USDA Office of Civil Rights, Policy and Planning Division
USDA OPA Publications Stockroom
US Air Force (USAF), Deputy Assistant Secretary
US Army Corps of Engineers
Jordan Creek Center #106
Regional Branch, Michael E. Holley, Unit Coordinator
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US Coast Guard, Environmental Impact Branch, Marine Environmental Protection Division
US Department of Energy, Office of Environmental Compliance, Director
US Department of the Interior (USDI), Fish and Wildlife Service
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US Naval Observatory, Naval Oceanography Division
US Navy, Environmental Protection Division

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Alaska Business Monthly, Editor, Rob Dalby
Alaska Geographic, Editor, Penny Rennick
Alaska One PBS
Alaska Public Radio Network (APRN), News Director, Linda Taylor
Alaskan Southeaster, Editor, Dave Fremming
Anchorage Daily News, Managing Editor, Pat Dougherty
Anchorage Daily News, Washington Press Office, Dave Whitney
Associated Press, Anchorage Press Office, Dean Fosdick
Capital City Weekly, Publisher, Renda Heimbigner
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High Country News, Editorial Editor, Betsy Martson
Island News, Editor & Publisher, William MacCannel
Juneau Empire, Managing Editor, Steve Reed
KAKM-TV PBS Anchorage
KATH-TV NBC Juneau, Production Manager, Rik Pruett
KCAW-FM (Raven Radio), Sitka, News Director, Steve Will
Ketchikan Daily News, Managing Editor, Scott Bowlen
KFMJ-FM Ketchikan, Station Manager, Bob Kern
KFSK-FM Petersburg, Manager, Tom Abbot
KHNS Radio
KHNS, Haines, News Director, David Reimer
KIFW-AM/KSBZ-FM, Sitka, General Manager, Bobbi Rusk
KIMO-TV ABC Anchorage, News Director, Charles Fedello
KINY AM, News Director, Chris Burns
KJMW-LP Ketchikan, News Director, Terry Miller
KJNO/KTKU, News Director, Pete Carren
KJNO-AM Juneau, Program Director, Shelly Kincaid
KJUD-TV ABC Juneau Superstation, Jennifer Payne
KJUD-TV KSUP Radio
KRBD-FM Ketchikan, News Director, Tim Barry
KRSA-AM Petersburg, Manager, Andrew Mazzella
KSTK-FM Wrangell, News Director, Peter Helgeson
KTKN-AM/KGTW-FM Ketchikan, General Manager, Jeff Seifert
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KTOO-TV PBS Juneau
KTUU-TV NBC Anchorage, John Tracy
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Sitka Sentinel, Editor, Thad Poulson
Skagway News, Matt Pranger
Skagway News, Editor, Jeff Brady
Wrangell Sentinel/Jade River publication, Editor, Seanne Saunders

Organizations and Businesses

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Admiralty Tours, Dale Anderson
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Alaskan Travel Adventures
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Big Game Guide, Ron Smith
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Citizens for Progress, Paul Nelson
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Crew International Tours, Raul Cordero
 Defenders of Wildlife, Alaskan Field Representative, Joel Bennett
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 Earthjustice Legal Defense Fund, Doug Ruley
 Environmental & Natural Resources Institute, UAA, Interim Director, Sal V.
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 Flywater Adventures, Richard Culver
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 Friends of Berners Bay, Dana Owen
 Friends of the Earth, Mike Holloway
 Gustavas Community Organization, President, Bruce Paige
 Gustavas Community Organization, Greg Streveler
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 Glacier Bay Tours/LO, Robert Giersdorf
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 Goldbelt Corporation, Joseph Beedle
 Haines Chamber of Commerce, Manager, Marilyn Huitger
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 Juneau Economic Development Council, Kirk Flanders
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 National Wildlife Federation, Director, Tony Turrini
 Native American Fish & Wildlife Society, Michelle Davis
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 Northern SE Regional Aquaculture Association, General Manager, Pete
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 Northern Star Cedar Products, Owner, Ralph Blankenship
 Northstar Treking, Bob Engelbrecht
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 Panhandle Rigging Loft, Inc., Manager, Rick Brame
 Pacific Rivers Conference, Lee Zukoski
 Prince William Sound Science Center, President, Gary Thomas

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SE Alaska Conservation Council, Buck Lundkugel, Bristol, & Koehler
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Seahook Charters, Larry Hooton
Sealaska Corporation, Rick Harris
Russell Dick
Sealaska Corporation, President & CEO, Chris E. McNeil
Seawind Cruisers, Ken Gehring
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Shee Atika, Inc., President & CEO, Robert Loiselle
Sierra Club, Juneau Group, Mark Rorick
Silver Bay Logging, Inc., President, Dick Buhler
Sitka Conservation Society, Else Page
Sitka Convention & Visitors Bureau, Executive Director, Michelle Blackwell
Skagway Chamber of Commerce, President, Jan Tronrud
Skagway Convention & Visitors Bureau, Executive Director, Steve Halloran
Society of American Forests, Alaska, Chair, Les Fortune
Soukup Wire Rope & Industrial Supply, President, Donald R. Soukup
South Central Timber Development, President, Joseph Henri
South Coast Inc., President, Jerry Renich
Southeast Alaska Guiding, , Hans Baertle
SE Alaska Seiners Association, David Bedford
Southeast Road Builders, President, Roger Schnabel
SE Alaska Conservation Council (SEACC), Executive Director, Katya Kirsch
SE Alaska Tourism Council, Executive Director, Lorene Kappler
Southeast Alaska Tourism Council, Lorene Palmer
Southeast Safari Tours, Stephan Olson
Stories & Legends, Cory Mann
Taku Conservation Society, Marylou King
Temsco Helicopters, Leslie Howell
Territorial Sportsmen, Bob Dewey
Territorial Sportsmen, Vice President, Ron Somerville
Territorial Sportsmen, Inc., President, Carl Rosier
Territorial Sportsmen, Inc., President, Mike Bethers
The Mill, Inc., President, Joe Herrera
The Nature Conservancy of Alaska, Director, Randall Hagenstein
Tongass Historical Society, President, Mike Dunning
Tourism Working Group, Bruce Gifford
United Cook Inlet Drift Association, Executive Director, Theo Matthews
United Fishermens of AK, Executive Director, Liz Cabrera
Upper Lynn Canal Advisory Committee, Chair, Tom Katzeek
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Wilderness Salmon Bake, Taku Glacier Lodge
Wilderness Society, Regional Director, Allen Smith
Ecotrust, John Petit
Wright Tours, Steve Wright
Yukon Jack's Glacier Tours, Basil Nickerson

Public Officials and Federally-reorganized Tribal Governments

Alaska House, District 5, Representative Kookesh
 Borough of Haines, Mayor, Jerry Lapp
 Chilkat Indian Village, President, Joe Hotch
 Chilkoot Indian Association, President, Lee Clayton
 City and Borough of Juneau, Planning Commissioner
 City and Borough of Juneau, Dave Miller
 City and Borough of Juneau, Parks and Recreation, Director, Kim Kiefer
 City of Haines, Mayor, Donald Otis
 City of Haines, Planning Commission
 City of Haines, Tom Healy
 City of Hoonah, Mayor, Albert W. Dick
 City of Skagway, Jeff Brady
 City of Skagway, City Manager, John Mielke
 Douglas Indian Association, President, Michael Dunlap
 Douglas Indian Association, Dorothy Owen
 Hoonah Indian Association, Frank Wright, Jr.
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 Office of the Governor, Central Office, Jackie Timothy, Project Review
 Coordinator
 Skagway Village, Lance Twitchell
 Tlingit-Haida Central Council, Cal Richert
 US House of Representatives, Honorable Don Young
 US Senate, Senator Ted Stevens
 US Senate, Senator Lisa Murkowski
 Village Council of Klukwan, President, Joe Hotch

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 Douglas Public Library
 Elfin Cove Public Library
 Haines Public Library
 Hollis Public Library
 Hyder Public Library
 Kake Community Library
 Kasaan Community Library
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 Mendenhall Valley Public Library
 Pelican Public Library
 Petersburg Public Library
 Skagway Public Library
 Tenakee Springs Public Library
 Thorne Bay Community Library
 Wrangell Public Library

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Individuals

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Paul Berry
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Sam Capp
Becky Carls
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